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DEVELOPMENT OF AIR FORCE FLIGHT SAFETY MODELS. VOLUME 16. FEASI--ETC(U)
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Final Report

DEVELOPMENT OF AIR FORCE FLIGHT SAFETY MODELS

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Volume 16

FEASIBILITY OF ADAPTING MODEL TO ROTARY WING AIRCRAFT; EXAMPLE: UH-1N

June 1976

Prepared for

SERVICE ENGINEERING DIVISION
SAN ANTONIO AIR LOGISTICS CENTER
Kelly Air Force Base, Texas

Under Contract F09603-72-A-1132-SA01

Publication C54-01-1-1406

ARINC RESEARCH CORPORATION

UNCLASSIFIED
SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER C54-01-1-1406	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) DEVELOPMENT OF AIR FORCE FLIGHT SAFETY MODELS VOLUME 16		5. TYPE OF REPORT & PERIOD COVERED
		6. PERFORMING ORG. REPORT NUMBER C54-01-1-1406
7. AUTHOR(s) Not Listed		8. CONTRACT OR GRANT NUMBER(s) F09603-72-A-1132-SA01
9. PERFORMING ORGANIZATION NAME AND ADDRESS ARINC Research Corporation 2551 Riva Road Annapolis, Maryland 21401		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS SERVICE ENGINEERING DIVISION SAN ANTONIO AIR LOGISTICS CENTER Kelly Air Force Base, Texas		12. REPORT DATE June 1976
		13. NUMBER OF PAGES 53
14. MONITORING AGENCY NAME & ADDRESS(If different from Controlling Office) SERVICE ENGINEERING DIVISION SAN ANTONIO AIR LOGISTICS CENTER Kelly Air Force Base, Texea		15. SECURITY CLASS. (of this report) UNCLASSIFIED
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

UNCLASSIFIED/UNLIMITED

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

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UNCLASSIFIED
SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

(9) Final Report,

(6) DEVELOPMENT OF AIR FORCE FLIGHT SAFETY MODELS

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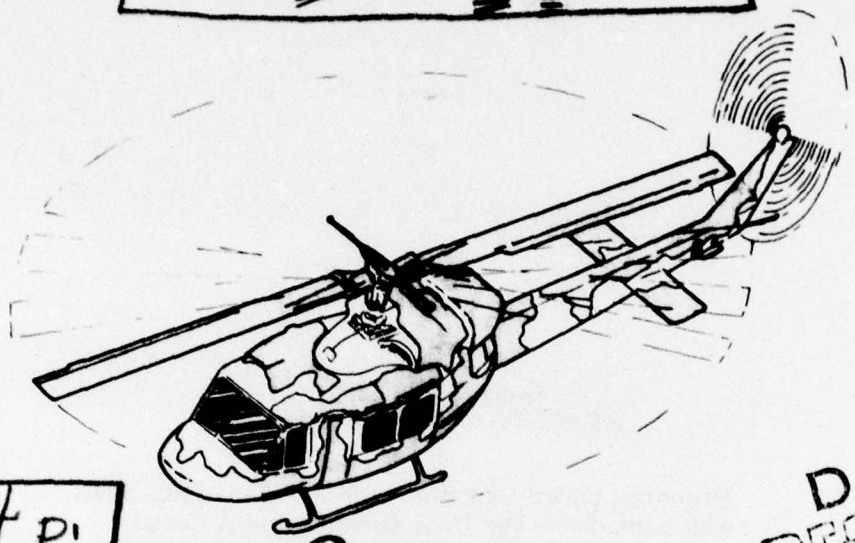
(4)



(12) 84 p.

(11) June 1976

Prepared for

SERVICE ENGINEERING DIVISION
SAN ANTONIO AIR LOGISTICS CENTER
Kelly Air Force Base, Texas

Under Contract (15) F09603-72-A-1132-SA01

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(14) Publication C54-01-1-1496-VOL-16

400 247

Prepared under Contract F09603-72-A-1132-SA01,
which grants to the U. S. Government a license
to use any material in this publication for govern-
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ABSTRACT

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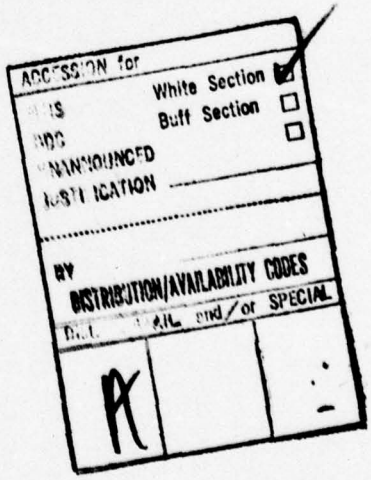


GLOSSARY

Safety-related terms used in this report are defined below. Certain of these terms are expressed in somewhat different words later in the text, depending on the context of the discussion; but the meaning will be consistent with the definitions given here.

Criticality – A numerical index of the significance of equipment failure history relative to aircraft safety. As an analysis parameter, criticality can be considered proportional to the likelihood that an item will fail and thereby cause an accident. It is the product of the failure probability and the sensitivity of an equipment item.

Dependency – See "link dependency".

FSPT – Flight Safety Prediction Technique

Flight phases – Discrete segments of the aircraft mission profile. For rotary wing aircraft, the flight phases are defined as 1) startup and taxi, 2) takeoff, 3) climb, 4) cruise, 5) tactics, 6) cruise, 7) descent, 8) land, and 9) taxi and shutdown.

Functional analysis – The determination of equipment relationships to aircraft functions performed, and the interrelationships of these functions.

Functional path – The compilation of functional relationship in which one function is identified as being dependent upon another.

Link dependency – The conditional probability of a dependent function failing, given that a particular function it is dependent upon has failed.

Provisory condition – Operation of an aircraft in a mode or environment such that the safety-related importance of certain equipments is increased. Provisory conditions include icing, night flights, supersonic flight, etc.

Provisory factor – The probability that a provisory condition exists. Also used to describe the coded notation serving to indicate that a functional relationship is dependent on a particular provisory condition.

Safety sensitivity – Same as "sensitivity".

Sensitivity – A quantitative indication of the degree of safety degradation to be expected if a function or equipment fails. The more specific terms are "functional sensitivity" or "equipment item sensitivity".

FOREWORD

This document is part of a 16-volume report describing the application to specific aircraft of ARINC Research Corporation's Flight Safety Prediction Technique (FSPT). The technique was developed under previous Air Force contracts (see Appendix A). The present effort, undertaken in 1972 under Contract F09603-72-1132-SA01, has led to further refinement of the FSPT through its broad application to many different types of aircraft. The flight safety models generated for these aircraft are presented in individual volumes of this report as follows:

Volume	Aircraft	Volume	Aircraft
2	T-38	10	B-52G, H
3	F-111A, FB-111A	11	C-130E
4	A-7D	12	KC-135
5	F-4D, E; and RF-4C	13	C-5A
6	C-141	14	T-39
7	A-37	15	F-15
8	O-2	16	Rotary Wing (Feasibility Study)
9	OV-10		

Volume 1, an overall summary of this effort, will be issued at the end of the contract period.

SUMMARY

This study concerned the feasibility of applying the Flight Safety Prediction Technique to rotary wing aircraft. It was found that the model developed for fixed wing aircraft was applicable to helicopters without change to the basic mathematical structure or computer process. No change in data requirements are necessary, since the same screening methods are used to generate the UH-1N malfunction rate as for other aircraft.

To assure that the study fully documented all aspects of a model of a rotary-wing aircraft, and that the model would perform as for previous fixed-wing models, a specific helicopter type – the UH-1N – was chosen for analysis.

Primary areas of modification to the FSPT to accommodate rotary wing aircraft included:

a. Redefinition of certain upper level functions in accordance with rotary-wing systems operation.

b. Redefinition of flight phases to conform with rotary-wing mission profiles.

c. Review of sensitivity assignments in light of autorotative and "land-most-anywhere" criteria.

d. Redefinition of a provisory factor.

CONTENTS

ILLUSTRATIONS AND TABLES

1
INTRODUCTION

1.1 BACKGROUND

The Flight Safety Prediction Technique developed by ARINC Research Corporation provides for assessment of the impact on flight safety of the failure of specific items of equipment within an aircraft. In the FSPT, mathematical modeling procedures are applied for processing aircraft-equipment failure data to yield a quantified index ranking safety-related problems on the basis of their likelihood of occurrence and the resulting degradation in the aircraft's capability to fly.

The ranking factor is called "criticality", which in its simplest form is the product of the failure probability and flight safety sensitivity of an equipment. (A more detailed definition appears in Section 2 and Appendix B.) The failure probability inputs are from basic failure data sources, AFM 66-1 and 65-110. The sensitivity estimates are derived by the following process:

a. Systematic analysis of aircraft functions to determine those essential to flight safety;

b. Identification of the hardware required to perform these functions;

c. Evaluation of the safety significance of the hardware in performing these essential aircraft functions.

The criticality values resulting from this approach provide a relative ranking of all malfunctions with respect to their safety significance. Figure 1-1 is a simplified example of how three equipment items would be ranked on the combined basis of their failure probability and safety sensitivity.

The methodology has the ability to rank malfunction problems currently and continuously by their accident potential. This ranking, based on criticality assessment can provide the basic parameters necessary for:

a. Identifying equipment items whose failure history and application pose a threat to aircraft safety;

b. Quantifying the degree of threat associated with each equipment item;

c. Evaluating and tracking the effectiveness of modifications to the aircraft;

d. Assessing safety benefits versus the cost of proposed aircraft modifications, changes in maintenance or flight operations, or alternative aircraft designs.

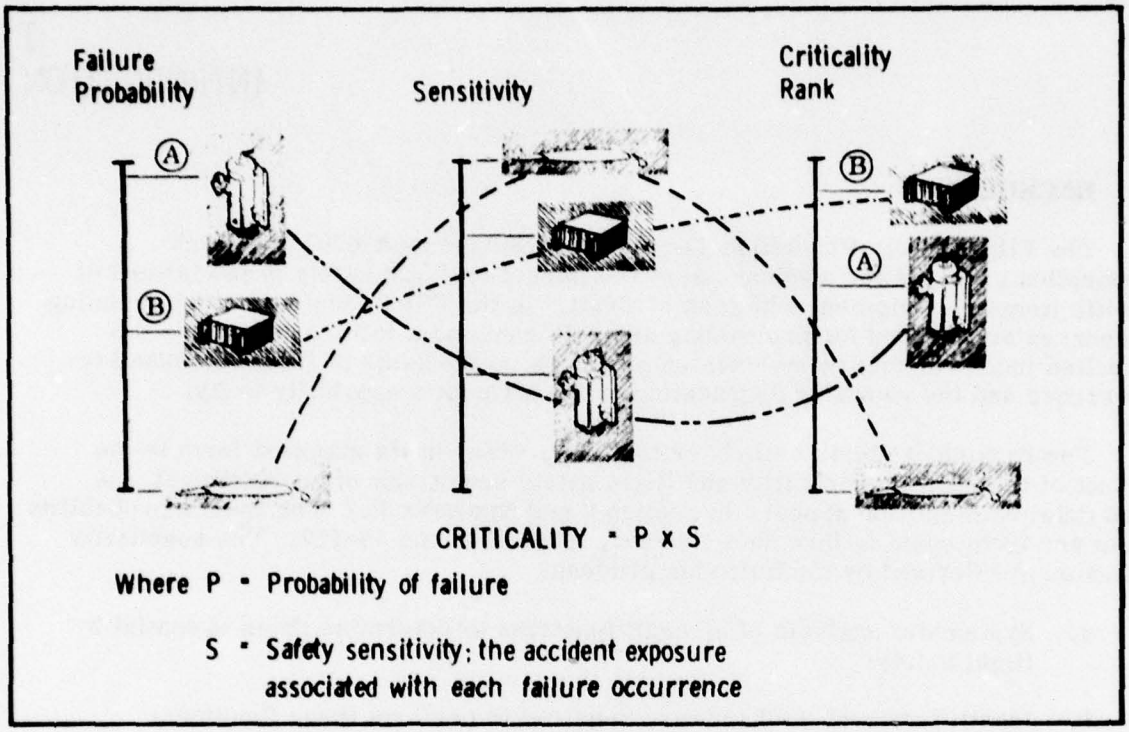


Figure 1-1. Example of Criticality Ranking Process

1.2 FORMAT OF REPORT

In this report, Section 2 will briefly describe the mathematical concepts underlying the Flight Safety Prediction Technique. Section 3 will discuss the model development and utilization of the technique in application for fixed-wing and then for rotary-wing aircraft. The similarities and differences will be noted. Section 3 will also discuss the general application of these concepts to the development of safety models for fixed- and rotary-wing aircraft, while Section 4 describes application activities related specifically to the UH-1N helicopter.

Appendix A summarizes the contractual history of the development of the FSPT; Appendix B discusses (as a supplement to Section 2) mathematical considerations underlying the technique; Appendix C discusses FSPT documentation methods; and Appendix D presents functional relationship diagrams and a listing of keypunch cards that comprise the safety model documentation for the UH-1N helicopter.

2
METHODOLOGY UNDERLYING FSPT

This section discusses the basic definitions and mathematical concepts associated with the Flight Safety Prediction Technique.

2.1 DEFINITION OF SAFE AIRCRAFT

To develop a relative measure of aircraft safety degradation resulting from specific equipment malfunctions, it is first necessary to define a "safe" aircraft. For purposes of the FSPT assessments, an aircraft is assumed to be in a safe condition if it is operating within its prescribed performance limits. Conversely, an aircraft operating (or about to operate) outside these limits is considered to be unsafe, i.e., in a condition where property damage and personal injury may result.

The safety prediction methodology does not attempt to assess the extent of possible personal injury or aircraft damage resulting from an unsafe condition. Neither does the concept consider ejection capability, parachutes, life rafts, etc., which do not make an aircraft safer per se but provide for the survivability of the aircrew when the aircraft is unsafe. Collision is also excluded from consideration because of the complexity of the interrelationships between pilot, aircraft equipment, ground surveillance, and traffic density.

2.2 MATHEMATICAL BASIS OF FSPT

The probability of an accident caused by the failure of an element can be expressed as the probability of the element failing multiplied by the conditional probability that the failure of the element will cause an accident. Stated in equation form:

$$P(\mathcal{A}, J) = P(j)P(\mathcal{A}|j) \tag{1}$$

where:

$P(\mathcal{A}, J)$ = Probability of an accident due to failure of just the j^{th} element*

$P(j)$ = Probability that element j fails

$P(\mathcal{A}|j)$ = Probability of an accident given that the j^{th} element fails.

*In this and subsequent discussions, unless otherwise stated, expressions such as "failure of the j^{th} element" should be interpreted to mean: failure of only the j^{th} element, assuming all other elements are not failed.

This equation reflects the basic relationships addressed in the FSPT where:

a. The criticality of the j^{th} element is an estimate of $P(\mathcal{A}, j)$

b. The sensitivity of the j^{th} element is an estimate of $P(\mathcal{A}|j)$

c. The failure probability of the j^{th} element is an assessment of $P(j)$.

Because an element's effect on safety may depend on the mission phase (see Section 3.2.1), the above model can be expanded to:

$$P(\mathcal{A}, j) = \sum_{k=1}^{N} P_{j,k} P(\mathcal{A}|j,k) \qquad (2)$$

where

N = Number of mission phases

$P_{j,k}$ = Probability that the j^{th} element is failed in the k^{th} phase

$P(\mathcal{A}|j,k)$ = The j^{th} element's sensitivity in the k^{th} phase.

To identify the importance of discrete elements to aircraft safety, two flight profiles consisting of nine distinct phases were defined, one for fixed-wing and the other for rotary-wing aircraft. The phases are discussed in Section 3.2.1.

To utilize equation 1, it was necessary to develop a method for obtaining the values of $P(\mathcal{A}|j,k)$, the probability that a malfunction in element j during mission phase k will result in an accident. This method in turn requires the estimation of two parameters: the probability of accident if a major function is not available during each mission phase, and the dependence of the major function on subfunctions and elements during each such phase.* Each function and equipment item thus derives its sensitivity value from its relationship to the major function(s) dependent upon it.

2.3 SENSITIVITY ASSIGNMENTS

A great deal of information is available on the causes of aircraft accidents, but little exists from which to make the sensitivity assignments, $P(\mathcal{A}|j)$. These assignments are therefore largely subjective, based on the analyst's knowledge of the system and any information he may have on previous accident history. The sensitivity assignments are reviewed (and revised as necessary) by an Air Force/contractor team working on a particular model to ensure that consistent criteria have been followed. The team review and negotiation of sensitivity assignments are the mechanism by which the value becomes sufficiently objective for use with the model. This negotiation considers all of those top level functions as a group, and reassigns sensitivity values as necessary to assure that the most objective proportionality is

*For a more detailed discussion of the mathematics of the FSPT, see Appendix B.

attained for the particular aircraft model. The same major-function sensitivity values are used for major functions on all aircraft models where configuration and mission profiles permit.

The development of criticality rankings for the various elements, or j's, is dependent upon the ability to quantify the failure probability, P(j), and the element sensitivity, $P(\mathcal{A}|j)$, for each element. Since the intent of the concept is to provide a relative safety ranking of all malfunctions, it is not necessary to develop absolute values for $P(\mathcal{A}|j)$. If the sensitivity values developed are correct relative to each other, a proper criticality ranking will be established. It is intended that criticality be an index proportional to $P(\mathcal{A},j)$ and therefore provide the same relative rank ordering of elements. The major reasons for proportionality, rather than equality, are:

a. The FSPT does not account for the effect of extraordinary pilot intervention to prevent an accident in case of equipment malfunction.

b. Criticality quantification was limited in its treatment of simultaneous occurrence of independent, primary failures.

While strict proportionality cannot be mathematically proven, it is believed that the criticality rankings provide reasonable relative measures of equipment problem potential.

3
MODEL DEVELOPMENT

Figure 3-1 summarizes the approach to the assessment of flight-safety criticality of aircraft equipment. Both the Air Force and contractor participate in this assessment. The first contractor activity is the identification of all functions that the aircraft is expected to perform and the determination of their interrelationships. Next, each functional relationship is documented, and then sensitivity assignments are made at the major functional levels. (Below these levels, link dependency values are estimated; see Section 3.2.2.) This process is carried out until each work unit code (WUC) associated with a major function has been identified with respect to the function performed, and dependencies have been estimated. Computer processing procedures calculate the safety sensitivity for each WUC item, combine these values with the operation and failure data input by the Air Force, and produce the equipment criticality ranking.

The above comments and relationships hold for both fixed wing and rotary wing aircraft. As will be shown in the following sections, a number of modifications in the areas of functional analysis and major function sensitivity assignment were necessary to adapt the model to accommodate rotary wing aircraft. The modifications were made to address the different physical characteristics and flight modes of the rotary wing aircraft.

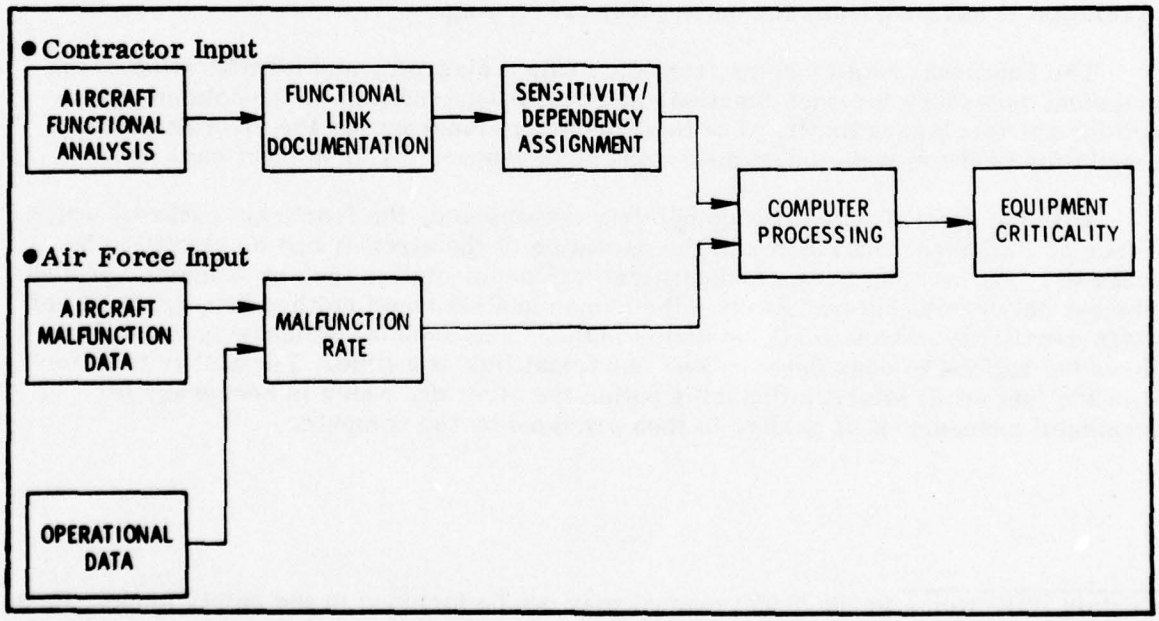


Figure 3-1. Activities and Data Inputs to Flight Safety Criticality Assessment

3.1 FUNCTIONAL ANALYSIS

Functional analysis entails the systematic identification of the relationships of hardware to the functions performed by the aircraft as documented in the aircraft Technical Orders. Tabulated for each aircraft function are the equipments necessary for its performance as well as all outputs required for other systems. The complexity of the functional interdependencies of an aircraft requires the use of a systematic accounting procedure, as discussed below, to assure that all relationships have been identified and that no functional paths have been overlooked.

Certain top-level or primary functions are applicable to all aircraft types, both fixed and rotary wing, and serve as the basis for a safety analysis. As shown in Figure 3-2, the basic differences between fixed and rotary wing aircraft are evidenced at the second or major-function level.

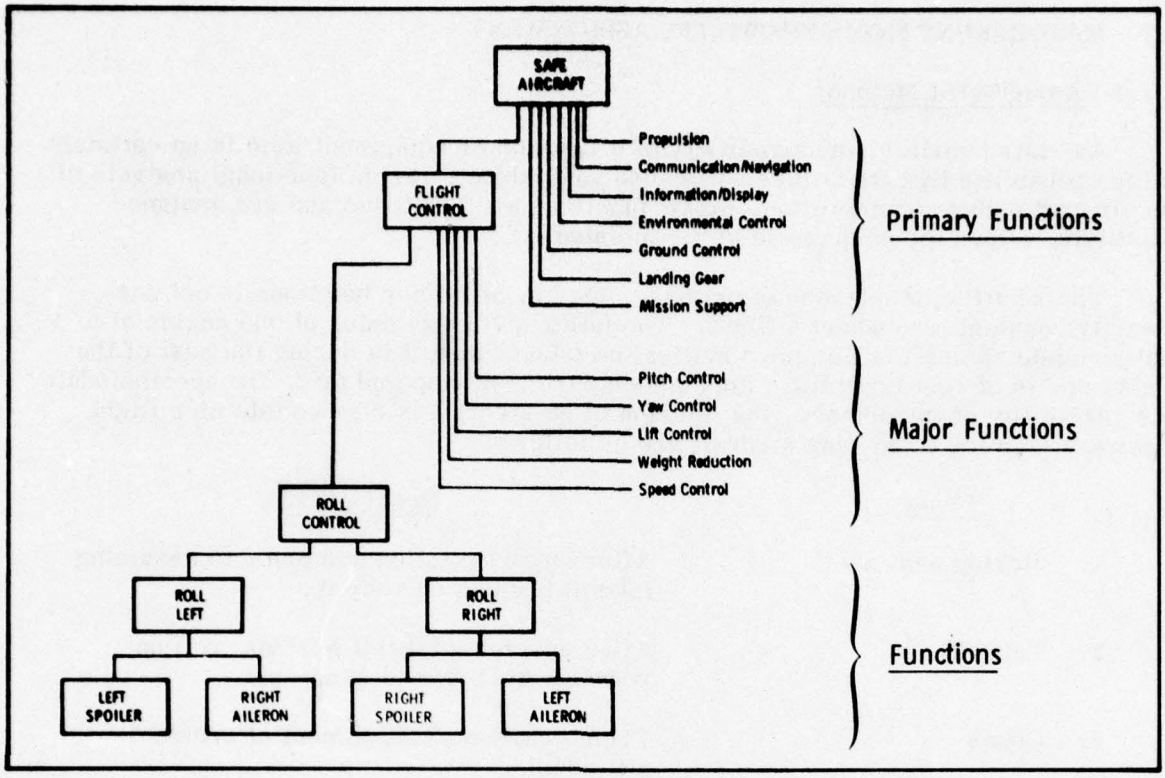
Below the major function level, the functional identification and structure are tailored to the particular equipment and functional relationships unique to the aircraft modeled. In Figure 3-2b, for example, the major function "Main Rotor Controls" is subdivided into "Cyclic Controls" and "Collective Controls". This structure is that applicable to a UH-1N aircraft in which cyclic controls provide primary aerodynamic life, and collective controls provide pitch and roll movements. Finally, each item in the aircraft WUC ("-06") manual is identified with respect to the function it performs.*

Except as noted above, documentation for a rotary wing aircraft can be accomplished just as for a fixed wing aircraft. Every function and every WUC included in the model receives an "alpha designator" unique to that aircraft model. Because of the large number of alpha designators required in a model, an indenturing system is utilized to prevent duplication. However, the location in the hierarchical structure and the number of characters in the alpha designators often do not correlate, since correlation is not necessary for subsequent processing.

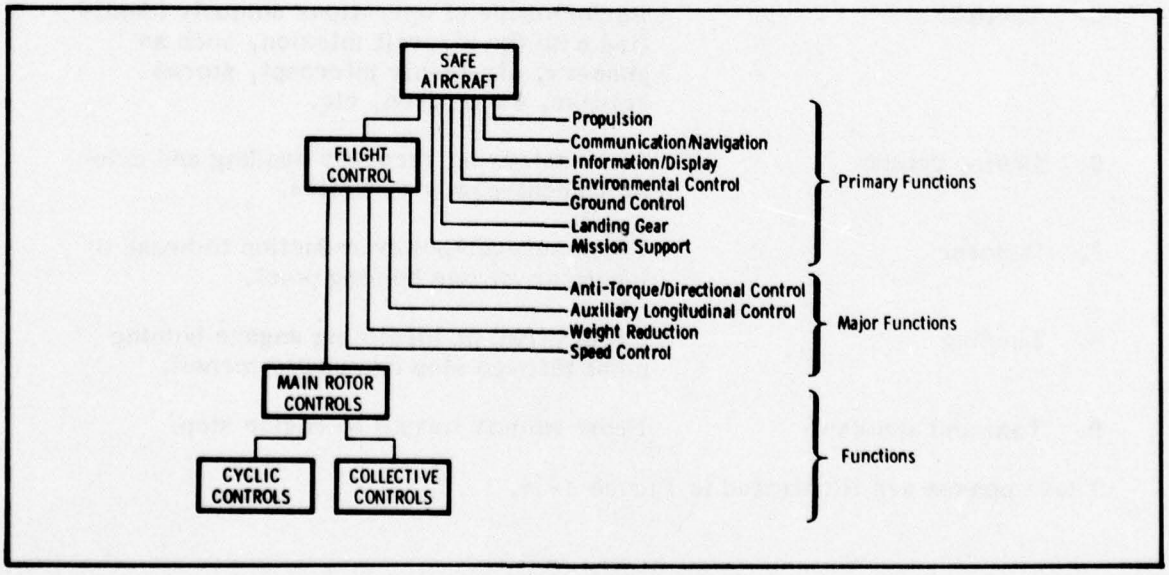
The functional relationships from the system diagram, and identification of the equipment necessary for each function, are next documented in an 80-column punch-card format (see Appendix C). The total functional diagram for the aircraft is then a compilation of the system diagrams, with one punchcard for each functional link.

With the aircraft functions completely documented, the functional paths by which a piece of equipment contributes to the operation of the aircraft can be identified by computer. Performing the path-identification/documentation task by computer proves to be not only useful but necessary – the human analyst could neither keep track of nor assign sensitivity values to all functional paths. The machine processing capability allows the analyst to consider only one functional link at a time. The ability to follow all of the functional interrelationships within the aircraft, which is necessary for meaningful assessment of safety, is then provided by the computer.

*Certain WUC items in the "-06" manual may not be included in the safety model, these items being either 1) eliminated by TCTOs, 2) purely structural items in the 11000 series, 3) necessary only for survivability or ejection, or 4) of lower indenture than the LRU level, where computer data screening eliminates failure reports.



a. Fixed Wing Aircraft Functions



b. Rotary Wing Aircraft Functions

Figure 3-2. Hierarchical Structure of Aircraft Functions

3.2 MAJOR-FUNCTION SENSITIVITY ASSIGNMENT

3.2.1 Assignment Method

As stated earlier, the sensitivity of a function or equipment item is an estimate of the probability that its failure will cause an accident. From functional analysis of the aircraft under consideration, major functions are identified and are assigned sensitivity values for each phase of the mission.

The relative importance of primary, major, and other functions is not necessarily constant throughout a flight. The failure, for example, of one engine of a multi-engine aircraft is far more critical on takeoff than it is during the rest of the flight, and is of relatively little importance during startup and taxi. To accommodate this variability of importance, the mission of an aircraft is divided into nine flight phases, which for fixed wing aircraft are as follows:

Phase	Description
1. Startup and taxi	After engine rotation and prior to assuming takeoff heading on runway.
2. Takeoff	After assuming takeoff heading; roll on runway; and prior to gear-up.
3. Climb	From gear-up to attainment of cruise altitude.
4. Cruise outbound	From the end of climb to initiation of tactical phase.
5. Tactical	Performance of operations uniquely identified with the aircraft mission, such as gunnery, air-to-air intercept, stores release, cargo drop, etc.
6. Cruise return	After achieving recovery heading and prior to descent-power reduction.
7. Descent	From descent-power reduction to break or localizer engage homing point.
8. Landing	From break or localizing engage homing point through stop or runway turnoff.
9. Taxi and shutdown	From runway turnoff to engine stop.

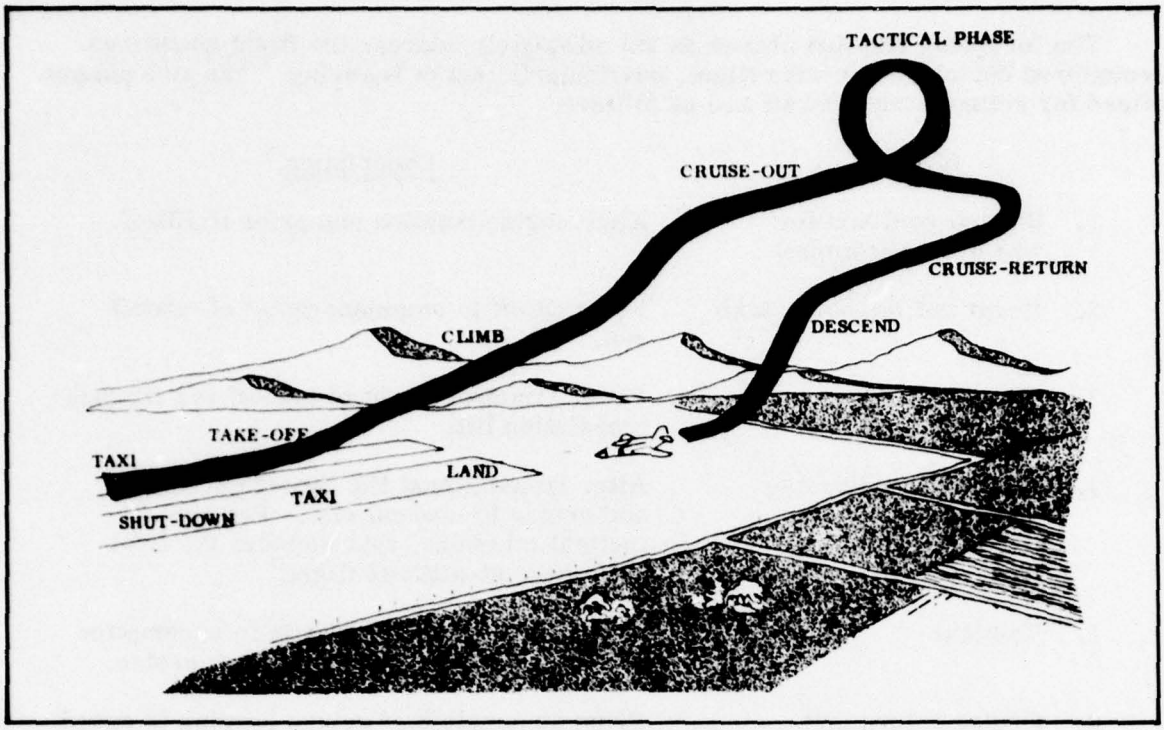
These phases are illustrated in Figure 3-3a.

The foregoing mission phases do not adequately address the flight conditions encountered during rotary wing flight, particularly that of hovering. The nine phases defined for rotary wing aircraft are as follows:

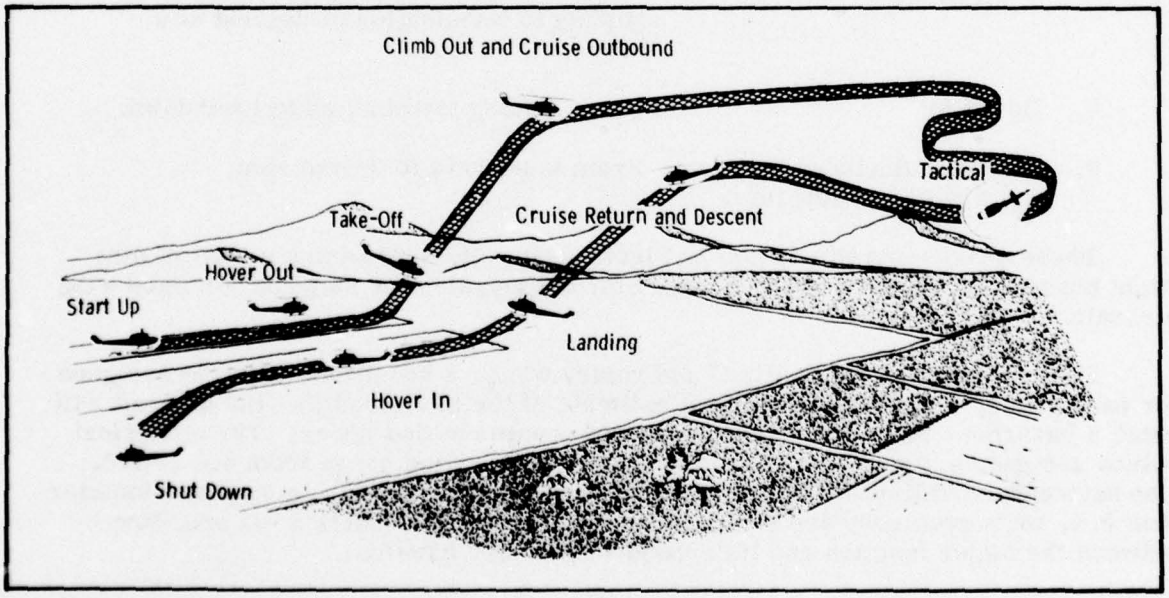
Phase		Description
1.	Startup (and taxi for wheeled helicopters)	After engine rotation and prior to liftoff.
2.	Hover out (airborne taxi)	From liftoff to commencement of takeoff run.
3.	Takeoff	From commencement of takeoff run through translation lift.
4.	Climb out and cruise outbound	After translational lift through climbout and cruise to tactical site. For non-tactical missions, this includes the first half of the at-altitude flight.
5.	Tactical	From arrival at tactical site to assumption of heading and altitude for return cruise.
6.	Cruise return and descent	From assumption of return heading to speed reduction in preparation for landing. For nontactical missions, this identifies the last half of the at-altitude flight.
7.	Landing to hover	From speed reduction in preparation for landing to termination of descent at a hover.
8.	Hover in	From landing termination to touchdown.
9.	Shutdown (includes taxi-in for wheeled helicopters)	From touchdown to engine stop.

These phases are illustrated in Figure 3-3b. By maintaining a total of nine flight phases, the model input-punchcard format remains the same as for fixed wing aircraft.

For both aircraft types (fixed and rotary wing), a sensitivity value is assigned for each phase, representing the best estimate of the likelihood that the aircraft will enter a hazardous mode if the function is not present in that phase. The numerical values assigned are proportional rather than absolute, and range from 0.0 to 1.0. The keypunch card limits this assignment to increments of 0.1. Increments smaller than 0.1, when required, are assigned by defining a quasi-function for insertion between the major function and its dependent primary function.



a. Fixed Wing Aircraft Mission



b. Rotary Wing Aircraft Mission

Figure 3-3. Phases of Aircraft Mission

3.2.2 Link Dependency Assignment

Link dependency is defined as the probability that the loss of a function will result in the loss of a dependent function. (For a more detailed discussion of this term, see Appendix B.) The assignment of link dependency values requires knowledge of the operation of specific aircraft because it is concerned only with functional levels below the "major" category. At this lower level, no evaluation is made of the impact on flight safety of the loss of functions, and no special procedures are required to accommodate rotary wing aircraft. Instead, the effect of the loss of one function on the performance of another function becomes the evaluation criterion.

Like sensitivities, link dependency values are assigned in increments of 0.1. Additionally, the method of attenuation used in assigning sensitivity values can also be applied to link dependencies.

3.2.3 Provisory Factors

The sensitivity of major functions with respect to aircraft safety – and at the lower levels, the link dependency between functions — can be dependent on external influences and aircraft operating conditions. To accommodate these external influences, a set of provisory factors has been identified. An example would be a windshield anti-ice system, which has a safety sensitivity close to 1.0 during landing under icing conditions but a negligible effect on a dry, warm day.

Under such circumstances, the procedure is to assign the worst-case value (assuming the condition exists). During model exercise the likelihood that the condition exists can be "read-in", thereby allowing the sensitivity value to be assigned by the computer based on the likelihood of the condition and the probability that the higher level function will therefore be lost. For the rotary wing safety model, one provisory factor was redefined (from its fixed wing form) to accommodate unique helicopter operating conditions. This factor is identified as Code C, in Table 3-1, which lists the standard provisory factors used in FSPT models. The specific use of the provisory factor B as applied to helicopters refers to operations in that portion of the flight envelope where auto-rotation is not available as a backup to the propulsion and auto-torque functions.

3.2.4 Computer Processing

For any aircraft, the documentation of a flight safety analysis by ARINC Research consists of functional diagrams, coded functional tabulations, a functional data processing card deck, and a machine-prepared printout of the card deck data. Under this contract the documentation is then sent to San Antonio Air Logistics Center (SA/ALC).

SA/ALC processes the functional data card deck through a series of computerized operations, as follows:

a. A functional deck edit is accomplished to identify format or logic errors.

b. A path identification/documentation run is made that traces all possible paths associated with each function and calculates the numerical sensitivities by flight phase down to the WUC level.

c. A path combination run is made taking into account the dependence of more than one major function on a particular WUC.

d. Failure information from the 66-1 data system and numerical factors for provisory conditions are input, and a WUC criticality list by rank order is generated by the computer.

Since no change in card format of other documentation methods is necessary for rotary wing application, no computer programming changes were necessary.

An additional product generated by the computer is a two-part criticality trend analysis. Part I contains the criticality rankings and linear regression analysis by WUC for the previous 12 months. Part II contains plots of the criticalities and regression lines for the 25 WUCs top-ranked according to safety criticality.

TABLE 3-1. PROVISORY FACTOR CODES

Code	Provisory Condition
A	Icing conditions
B	Adverse speed/altitude operations
C	Runway stopping distance (fixed wing) Confined area operations (helicopter)
D	Night operation
E	IFR conditions
F	Supersonic flight
G	Rain
H	Solo flight
I	Loss of function for which indication is provided
K	Normal system failed
T	Flame-out
X	Fire
Y	Cold weather
2	One of three available units is required
3	Two of three available units are required
4	One of four available units is required
5	Two of four available units are required
6	Three of four available units are required
8	Four of eight available units are required

3.2.5 Model Maintenance

Each time an aircraft type for which a safety model has been developed undergoes a modification, the effects of the changes on the model must be evaluated. Technical order and WUC revisions must be incorporated into the model. Removal of existing hardware, installation of new hardware, or design improvements may change

link dependencies and sensitivity assignments. The update procedure should follow the same general steps as outlined for the initial analysis effort.

Existing block diagrams and a printout of the functional card deck form the baseline for change identification. Functional relationships should be reviewed to determine the impact of changes on the documented safety analysis. Diagrams should be revised to reflect functional differences, WUC changes should be noted, and all differences listed on a flight-safety functional tabulation sheet. The functional deck printout can be used for manual indication of what the changes are and where they occur. New data cards are prepared and the functional deck updated by the removal of obsolete cards and the insertion of new cards. From this point on, the computer is again utilized to edit the functional deck, perform path identification/documentation, and calculate sensitivities for each WUC.

Block diagrams and other affected portions of the specific aircraft safety analysis report should be updated and revised pages issued that reflect these changes. Maintaining an accurate and updated model is important to obtaining an accurate assessment of the safety significance of hardware failures.

4
UH-1N MODEL DEVELOPMENT

An FSPT model for the UH-1N helicopter was developed to evaluate the feasibility of applying the modeling methodology to rotary wing aircraft. The initial step was a review of the basic FSPT model for any inconsistencies that would affect the adaptation to rotary wing application. Next, the flight phases were reviewed and redefined in accordance with helicopter flight operations. Allowances were made for hover flight, and for the differences in takeoff/landing flight characteristics between rotary and fixed wing aircraft. New and revised provisory factors were incorporated for extreme rotary wing flight conditions (i.e., high altitude hover, confined area flight maneuverability) where recovery from a system failure is less likely. The total aircraft documentation was submitted for "GO 95" computer edit at SA/ALC in July 1975.

The aircraft flight manual and maintenance technical orders provided the information on aircraft system operation. The model developed represents the UH-1N helicopter configured to the latest TCTOs documented in the manuals supplied by SA/ALC. Table 4-1 lists the manuals and their revision status applicable to the developed model.

The UH-1N safety model was developed by ARINC Research for all systems of the aircraft. Although the UH-1N is a fixed-skid aircraft, landing gear and ground control were included as primary functions to ensure consistency with the previous FSPT models and establish the precedence for the modeling of wheeled rotary wing aircraft.

Because of the vulnerability of the functional logic/sensitivity documentation of such errors as omission of links, duplication of cards, and keypunching, quality reviews were conducted at various critical points in the model development. Each card was checked against the functional links of the diagrams to assure accuracy and completeness. Work unit codes used in the model were checked against the WUC manual to assure completeness.

Appendix C presents the methods and standards used in documenting an FSPT aircraft model. Appendix D presents the FSPT documentation for the UH-1N helicopter.

TABLE 4-1. UH-1N HELICOPTER SYSTEM DOCUMENTATION

Nomenclature	Title	Revision/Date
T.O. 1H-1(U)N-1	Flight Manual	Change 3/20 Jan 75
T.O. 1H-1(U)N-2-1	Organizational Maintenance	Change 11/25 Apr 75
T.O. 1H-1(U)N-06	Work Unit Code	Change 1/8 Apr 75

APPENDIX A

HISTORICAL SUMMARY OF FSPT

HISTORICAL SUMMARY OF FSPT

In 1965, the desirability and practicability of quantifying the significance of specific equipment malfunctions relative to flight safety was explored in a feasibility study conducted by ARINC Research Corporation for the Air Force. The feasibility of a safety-quantification approach, which has subsequently become known as Flight Safety Prediction Technique (FSPT), was demonstrated; and the method was developed and refined in a series of studies, as follows:

Study Phase	Subject/Date	Sponsor*/Publication No.
I	Feasibility Study, September 1965 to June 1967 (Phase I)	Sacramento Air Materiel Area (SMNE), Contract AF09(603)62335, SM-67-2; publication 705-01-1-777
II-A	Technique Development, October 1967 to July 1968 (Phase II-A)	San Antonio Air Materiel Area (SANEW), Contract AF09(603)-67-A-0267-SA01; publication 734-01-1-895
II-B	Technique Development, July 1968 to July 1969 (Phase II-B)	San Antonio Air Materiel Area (SANEW), Contract F09(603)-68-A-0317-SA01; publication 754-01-1-985 (Revision 1)
	FSPT System Documentation for the F-4C and T-37 Aircraft, October 1970 to June 1971	San Antonio Air Materiel Area (MMER) Contract F41608-71-C-0576; publication 697-01-1-1118

In the Phase II-B study, the FSPT was applied to the F-106 aircraft. Concurrent with Phase II-B, the U.S. Naval Safety Center contracted ARINC Research to extend the methodology to produce a flight safety criticality model for the F-4J aircraft. The results of this effort are documented in ARINC Research Publication 753-01-3-982 (Revision 1).

In 1970, ARINC Research was contracted to develop suitable input data to permit the application of the technique to the T-37 and F-4C aircraft. These data were derived in the form of mathematical model functional documentation as input to the basic computer program developed and applied to the F-106.

In 1972, ARINC Research Corporation was awarded a contract, with the subsequent modifications in 1973 and 1974, to apply the Flight Safety Prediction Technique to 15 aircraft, working jointly with cognizant Air Logistics Centers. Aircraft to which the FSPT has been applied under this latter contract (F09603-72-A-1132-SA01) include:

a. T-38

b. F-111A and FB-111A

*The office symbols of Service Engineering at the Sacramento and San Antonio Air Materiel Areas are now SM/ALC/MME and SA/ALC/MME, respectively.

c. A-7D

d. F-4D, E; RF-4C

e. C-141

f. A-37

g. O-2

h. OV-10

i. B-52G, H

j. C-130E

k. KC-135

l. C-5A

m. T-39

n. F-15

o. UH-1N Helicopter*

*Feasibility study of adaptation of FSPT to rotary-wing aircraft.

APPENDIX B

FORMULATION OF CRITICALITY-ASSESSMENT TECHNIQUE

FORMULATION OF CRITICALITY-ASSESSMENT TECHNIQUE

To implement the basic safety model defined in Section 2.2, it is necessary to develop a submodel for the probability that a malfunction in element j during mission phase k will result in an accident. This submodel in turn requires that we estimate two parameters: the probability of accident if a major function is not available during each mission phase, and the dependence of the major function on element j during each mission phase.

The first parameter is termed "functional sensitivity" and is estimated for each major function. The functional analysis performed in this task established for an aircraft the following hierarchal scheme:

Aircraft

Primary functions

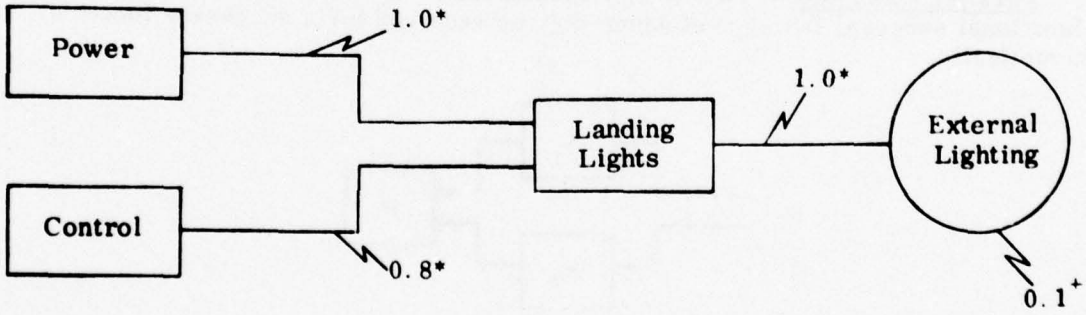
Major functions

Function

Elements (Work Unit Codes)

A primary function would be one such as Flight Control. Major functions under Flight Control would include Pitch Control and Yaw Control.

The second parameter, "link dependency," is a vehicle for showing the influence of each functional-path element on the performance of a major function. For example, if the major function being considered is External Lighting, the following diagram illustrates the nature of functional sensitivity and link dependency values.



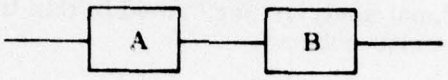
*Link dependencies
+Functional sensitivity

The 0.8 value means that failure of the Control function will result in loss of the Landing Light function 80% of the time. The 0.1 functional sensitivity value denotes that loss of external lighting will result in an accident 10% of the time. The values must be interpreted in a proportional sense, in that the actual accident probability is dependent upon external factors (see Section 3.2.3).

The remainder of this appendix discusses the procedures and model used to obtain element sensitivities; e.g., in the above example, the accident probability given that a Work Unit Code in the Control function malfunctions.

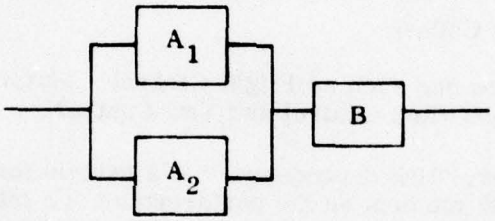
Three principal types of functional relationship--series, redundant, and parallel--were identified as representing the major forms to consider in modeling element sensitivity.

Series Relationship – A function having only one input. Schematically,



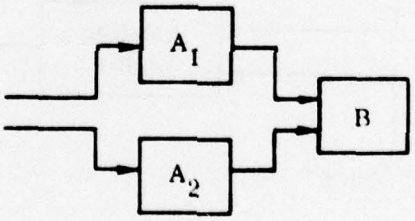
which indicates that outside of its own elements, the success of function B is only affected by the success of function A.

Functional Redundancy – A function having one or more backup functions that can provide the required inputs to successor functions. Schematically,



where A_1 and A_2 represent a functional redundancy in that either may provide the necessary input to B.

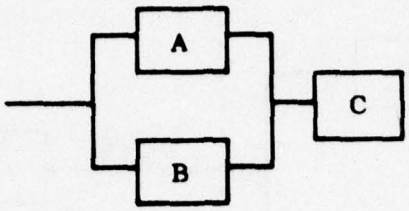
Parallel Functions – Two or more functions independent of each other in terms of functional success, but each of which may be required for a successor function. Schematically,



B will generally require both A_1 and A_2; but A_1 does not depend on A_2, nor does A_2 depend on A_1.

In some cases the distinction between functional redundancy and parallel paths is very slight, and may depend on mission phase. For example the four engines of a plane can be considered to be a redundant configuration providing inputs to the primary propulsion function during cruising, but would generally be considered to be parallel functions during takeoffs requiring full power.

In general, given a schematic relationship of the form,

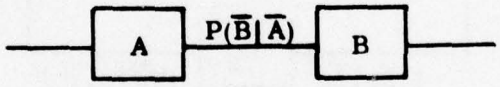


we can say that A and B are in a functionally redundant configuration if the success probability of C is the same if 1) A and B are successful, 2) A only is successful, or 3) B only is successful. If, for example, C is more likely to be successful if both A and B are successful, rather than A or B alone, then the relationship is one of parallel paths.

It is noted that the model will also account for element redundance and parallel elements through inputs such as $P(\overline{A}|i_a)$, representing the probability that the A^{th} function fails given that the i_a^{th} element in A has failed. If i_a is a parallel element, the probability would depend on mission requirements and other parallel-element states.

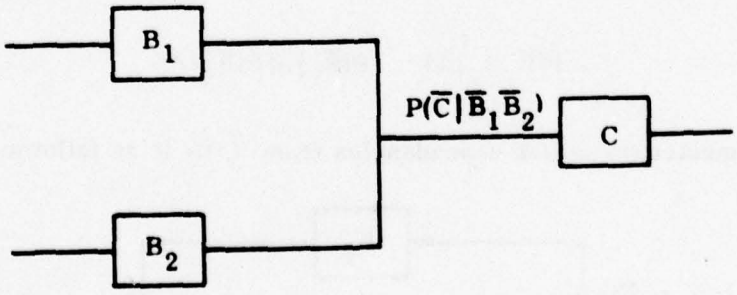
Link dependency is the conditional probability of a functional failure, given the failure of immediate predecessor functions. The link dependencies applicable to the three basic designs defined above are shown below.

Series Relationship

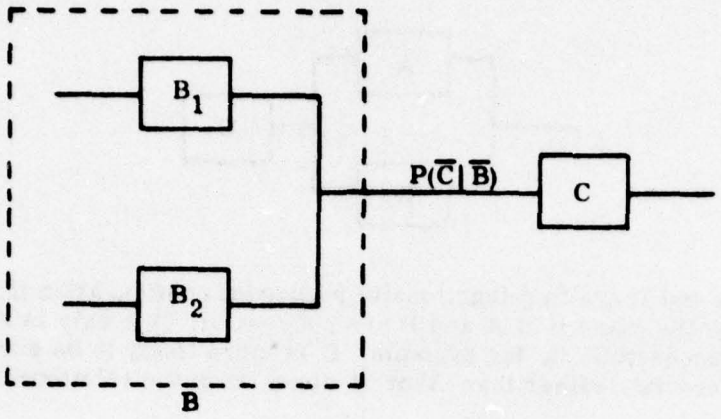


Link dependency = $P(\overline{B}|\overline{A})$ = probability that B fails given that A fails.

Functional Redundancy

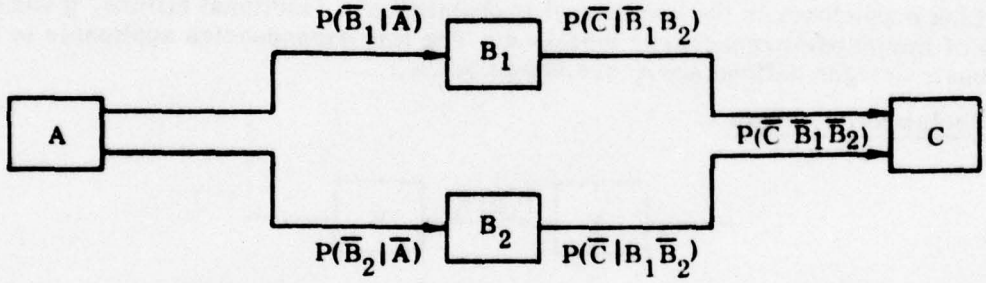


equivalent to



where $\bar{B} = \bar{B}_1\bar{B}_2$

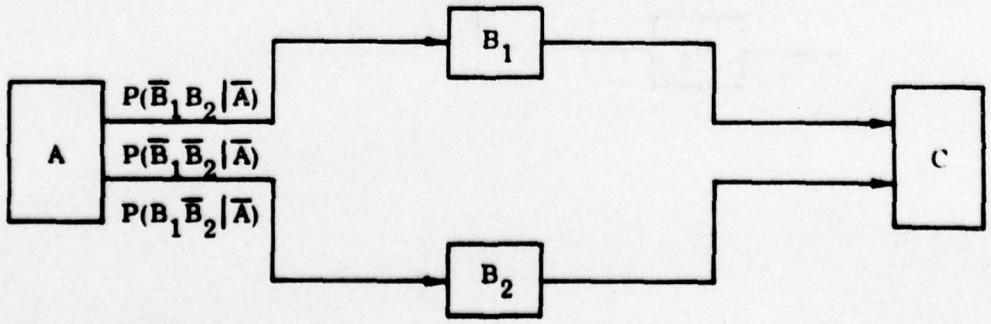
Parallel Functions



We shall generally assume that the dependencies of B_1 with respect to A, and of B_2 with respect to A, are independent of each other, so that

$$P(\bar{B}_1\bar{B}_2|\bar{A}) = P(\bar{B}_1|\bar{A})P(\bar{B}_2|\bar{A})$$

We then can consider three link dependencies from A to B as follows:



noting that

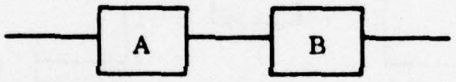
$$P(\overline{B}_1|\overline{A}) = P(\overline{B}_1 B_2|\overline{A}) + P(\overline{B}_1\overline{B}_2|\overline{A})$$

$$P(\overline{B}_2|\overline{A}) = P(B_1\overline{B}_2|\overline{A}) + P(\overline{B}_1\overline{B}_2|\overline{A})$$

Models are shown below for determining the sensitivity of elements within a function for each of the three basic designs. The following basic assumptions apply:

a. Except for cases where an element has a redundant or parallel counterpart or is located in a function with a redundant or parallel function, only the element under consideration shall be assumed to have failed initially. Thus the expression $P(\mathcal{A}|i_a)$, representing the accident probability given failure of the i^{th} Work Unit Code element, is based on the assumption that no other element has failed unless element i is in some redundant or parallel configuration. For cases in which there are redundant or parallel counterparts, failures of such counterpart elements or functions are considered in accordance with their occurrence probabilities.

b. The success of all immediate predecessors ensures the success of a function, provided that the function experiences no element failures. Thus for the series function relationship



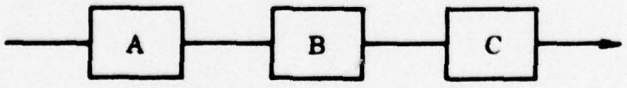
we assume

$$P(\overline{B}|A) = 0,$$

provided B experiences no element failures. If an element in function A is under consideration, the latter provision is always true by assumption "a."

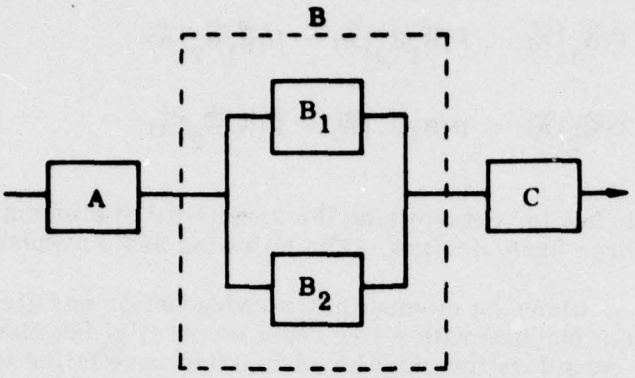
The element sensitivity models are:

Series Relationship



$$P(\mathcal{A}|i_a) = P(\overline{A}|i_a)\,P(\overline{B}|\overline{A})\,P(\overline{C}|\overline{B})\,P(\mathcal{A}|\overline{C})$$

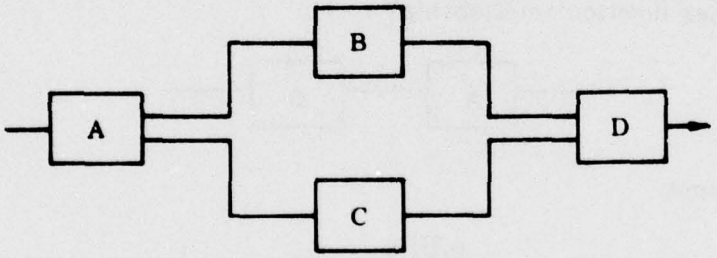
Functional Redundancy



$$P(\mathcal{A}|i_a) = P(\bar{A}|i_a)P(\bar{B}|\bar{A})P(\bar{C}|\bar{B})P(\mathcal{A}|\bar{C})$$

$$P(\mathcal{A}|i_{b1}) = P(\bar{B}_1|i_{b1})P(\bar{B}_2)P(\bar{C}|\bar{B})P(\mathcal{A}|\bar{C})$$

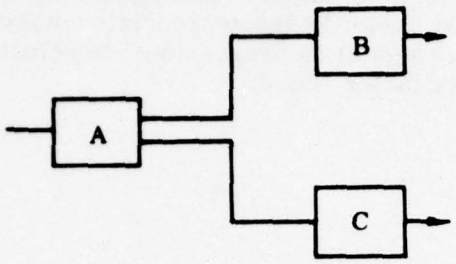
Parallel Functions



$$P(\mathcal{A}|i_a) = P(\bar{A}|i_a)\{P(\bar{B}C|\bar{A})P(\bar{D}|\bar{B}C) + P(B\bar{C}|\bar{A})P(\bar{D}|B\bar{C}) + P(\overline{BC}|\bar{A})P(\bar{D}|\overline{BC})\}P(\mathcal{A}|\bar{D})$$

$$P(\mathcal{A}|i_b) = P(\bar{B}|i_b)\{P(\bar{C}|i_b)P(\bar{D}|\overline{BC}) + P(C|i_b)P(\bar{D}|\bar{B}C)\}P(\mathcal{A}|\bar{D})$$

A case not explicitly incuded in the above three basic functional relationships is one for which a function is in two paths, e.g.,



then

$$P(\mathcal{A}|i_a) = P(\overline{C}|i_a)P(B|i_a)P(\mathcal{A}|\overline{C}B) + P(C|i_a)P(\overline{B}|i_a)P(\mathcal{A}|C\overline{B})$$

$$+ P(\overline{C}|i_a)P(\overline{B}|i_a)\{1 - P(\overline{\mathcal{A}}|\overline{C})P(\overline{\mathcal{A}}|\overline{B})\}$$

where it is assumed that the effects of loss of the major functions in accident occurrence are independent of each other.

Use of Numerical Provisory Factors for Partially Redundant Systems

The numerical provisory factors (see Table 3-1) are used where more than two identical functions are involved in a redundancy. For example, aircraft with more than two engines often have identical and independent systems for hydraulic pressurization, and for electrical power generation, one driven by each engine. If the aircraft can be operated safely with one or more of such systems in a failed state, one of the numeric codes is utilized in assigning link dependency values. Consider, for example, the following:

If N identical and independent units* are available and at least M are required for safe operation, where $0<M<N$, then the provisory factor of a given unit, say U_j, is the probability that the failure of U_j will cause the aircraft to enter an unsafe state. This is the probability that exactly M-1 of the remaining N-1 units will be in an unfailed state. This probability can be calculated by the formula for the binomial distribution, and is given by

$$P(U_j) = \binom{N-1}{M-1} p^{(M-1)} q^{(N-M)}$$

where $P(U_j)$ = probability that failure of the j^{th} unit will cause the aircraft to enter an unsafe state, and

M = Number of units required

N = Number of units available

p = Probability that a single unit will be in an unfailed state

q = Probability that a single unit will be in a failed state or (1-p)

*Units may be either elements, element assemblies, or functions.

Assignment of link dependencies to N identical and independent units of which only M are required proceeds as follows. The value assigned to each unit is the dependency of the higher level function on receiving an output from M of the units (usually 1.0). The provisory factor is the appropriate numeric code. In the evaluation of the path sensitivity, the computer is programmed to select the binomial formula that corresponds to the provisory factor listed.

APPENDIX C

FSPT DOCUMENTATION METHODS

FSPT DOCUMENTATION METHODS

Because of the extreme complexity of aircraft, it is necessary to develop a computerized method to identify and document all possible paths associated with each function as well as to determine the safety sensitivity associated with each path. A computer routine has been devised that takes the data from the functional card deck and traces and documents all paths. For each WUC, it also computes the flight-phase sensitivities for each path in which the WUC is present. The resulting computer printout provides a combined functional path sensitivity.

C.1 ALPHA CODING

As each system of the aircraft is functionally diagrammed, the functional blocks are assigned an "alpha code". This code aids the analyst in the bookkeeping tasks of functional diagramming and provides the computer with an identification of the elements to be processed. For standardization among aircraft, nine top-level functions have been defined and each has been assigned an initial or first-alpha designator. Each block in the functional diagram carries the same initial alpha as the top level function. Subsequent letters added to the initial alpha uniquely identify each block.

The only restrictions placed on the assignment of alpha codes are that:

a. All characters in a code must be a letter of the alphabet, and

b. The maximum number of characters in one code is seven.

C.2 ALPHA CODING AND COMPUTER PROGRAM COMPATIBILITY

Additional rules for alpha coding required to obtain the desired results from computer processing include:

a. When a WUC item operates in the same mode to perform more than one function, the same alpha code is used in each application.

b. When a WUC item operates in a different mode to perform each of more than one function, a different alpha designator is assigned for each operating mode.

C.3 FUNCTIONAL TABULATION

The "Flight Safety Functional Tabulation" sheet is used to code the safety model for keypunching. The sheets are coded as follows (refer to Figure C-1) for an example).

a. Columns 1 through 3. Used to identify the aircraft represented by the model. For certain aircraft modeled under this contract more than one model – designation series MDS – was included. For instance, a single functional deck was created for four MDSs of the F-4 aircraft. Cards with "F4b"* in columns 1-3 were common to all aircraft. For example,

*b = blank

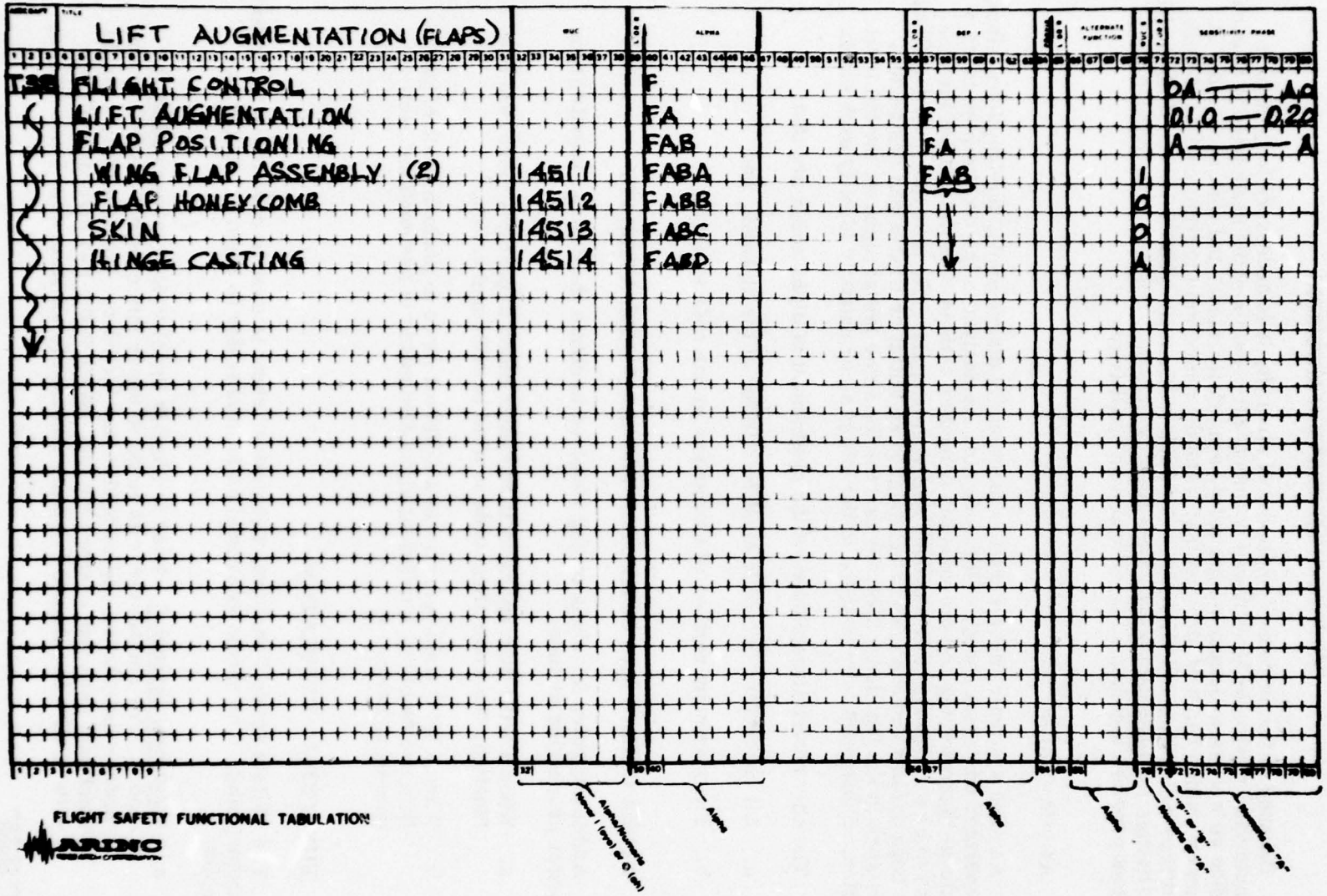


Figure C-1. Flight Safety Functional Tabulation

when these cards are combined with those carrying "F4E" in columns 1-3, then it produces an F-4E FSPT model deck.

b. Columns 4 through 31. Contain the title of the function or the WUC item.

c. Columns 32 through 36. Contain the left-justified WUC number.

d. Columns 37 and 38. Blank

e. Columns 39 through 46. Contain the assigned alpha designator for the function and/or the WUC. Column 39 contains either an L or an R, or is blank. The L and R designate left and right for those instances when the function and/or WUC pertains to the left or right side of the aircraft.

f. Columns 47 and 48. Blank.

g. Columns 49 through 55. Normally left blank, but are used after a deck is operational to substitute the data on a card for that stored in the computer by punching the line record number in this field.

h. Columns 56 through 63. Identify the dependent functions for either the function or specific WUCs being coded. Column 56 may contain L, R or blank for the same purpose as that of column 39.

i. Column 64. Contains the alphanumeric code of the "provisory factor" applicable to the link value assigned.

j. Columns 65 through 69. Contain the alpha designator of a function that is an alternate for the function being coded. (Column 65 is used for "L" or "R" as in Column 39.) The presence of the "alternate alpha" flags the importance of the link dependency as being affected by the success probability of the alternate function.

k. Column 70. Contains the work unit code dependency value (1 = 0.10; 2 = 0.20; ....A = 1.0). This value is applicable to all flight phases.

l. Column 71. Contains special instructions to the computer through the use of letters F, S, or being blank. Cards with an "S" or "blank" in column 71 are used in sensitivity computations. Cards with an "F" document a functional relationships which, although present in the system, would produce an erroneous sensitivity value when combined with other nonindependent paths (having the same function in common at some higher level). The "F" prevents the computer from including the link in the sensitivity calculations.

m. Columns 72 through 80. Contain functional dependencies for each of nine flight phases as described in Section 3.2.1 of the text. Coding is the same as for column 70.

C.4 DIAGRAM CONSTRUCTION

The diagrams produced under the contract document the functional interrelationship of the aircraft systems considered in the model. In the interest of extending the useful life of the diagrams, WUC items are not shown, thereby eliminating the necessity of updating the diagrams with each (and sometimes frequent) change to the WUC manual.

As discussed earlier in this report, the diagrams represent the hierarchal structure of the paths from which the sensitivity values are derived. The diagrams, although consistent with the system schematic and reliability block diagrams, are not equivalent due to this hierarchal method of documentation. In the actual system, signals and/or fluids pass from one component to the next and are thus documented in schematics; conversely, the hierarchal approach only identifies the components that must operate to achieve a given function, independent of the direction and/or sequence of signal flow. This approach directly addresses the system impact of a component failure without the necessity of identifying the intrasystem secondary failures. Each line connecting functions on the diagram is documented by a punchcard, with the lower function providing the "alpha designator" and the higher function's alpha designator indicator as the "dependent function".*

*The card deck also documents functional relationships not shown on the diagram; the work unit codes (mentioned earlier) and the "S" cards discussed in paragraph C.3.1.

APPENDIX D

FSPT DOCUMENTATION OF UH-1N AIRCRAFT

FSPT DOCUMENTATION OF UH-1N AIRCRAFT

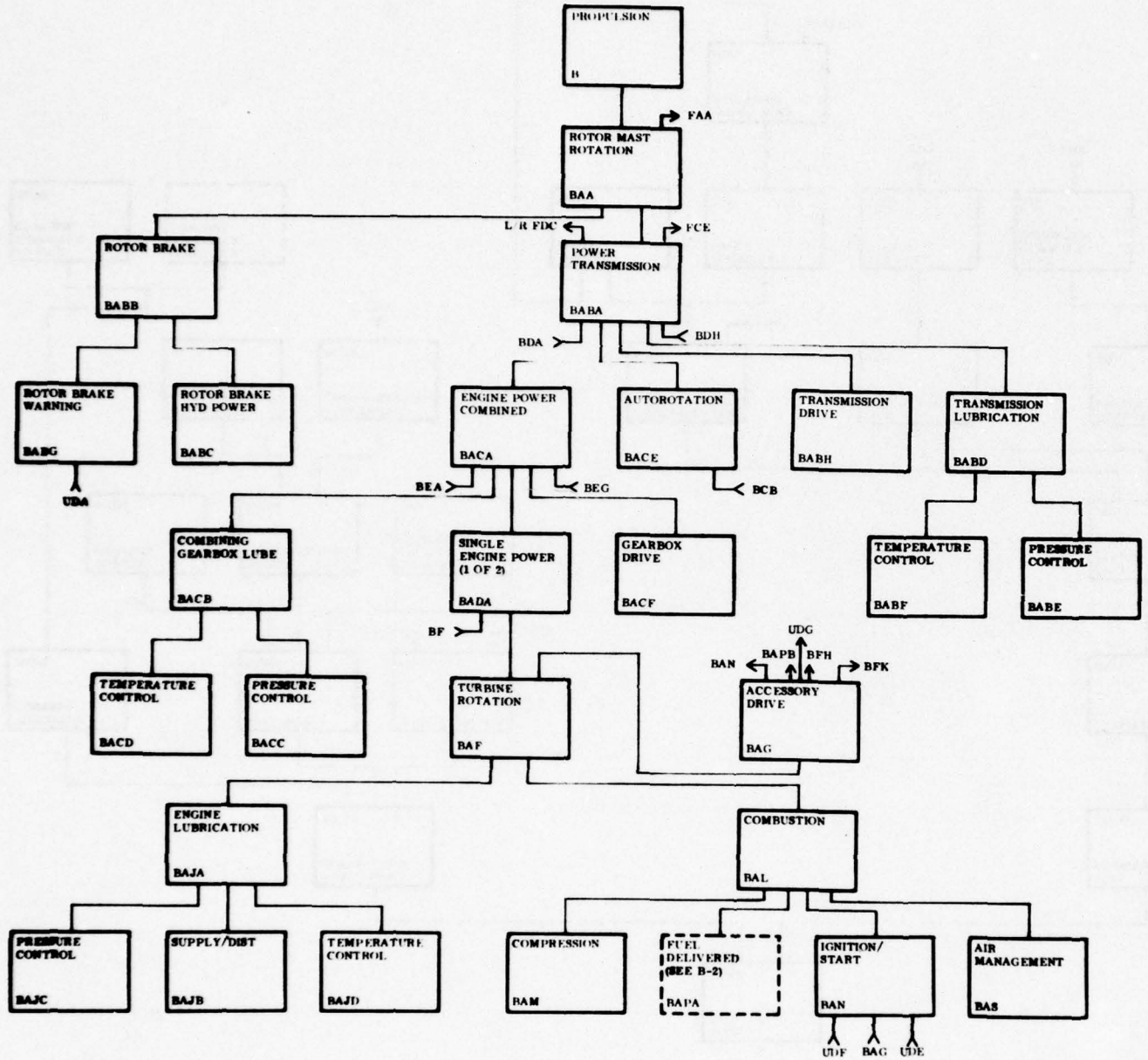
This appendix contains the functional relationship diagrams and a listing of the keypunch cards that comprise the FSPT safety model documentation for the UH-1N aircraft.

D.1 DIAGRAMS

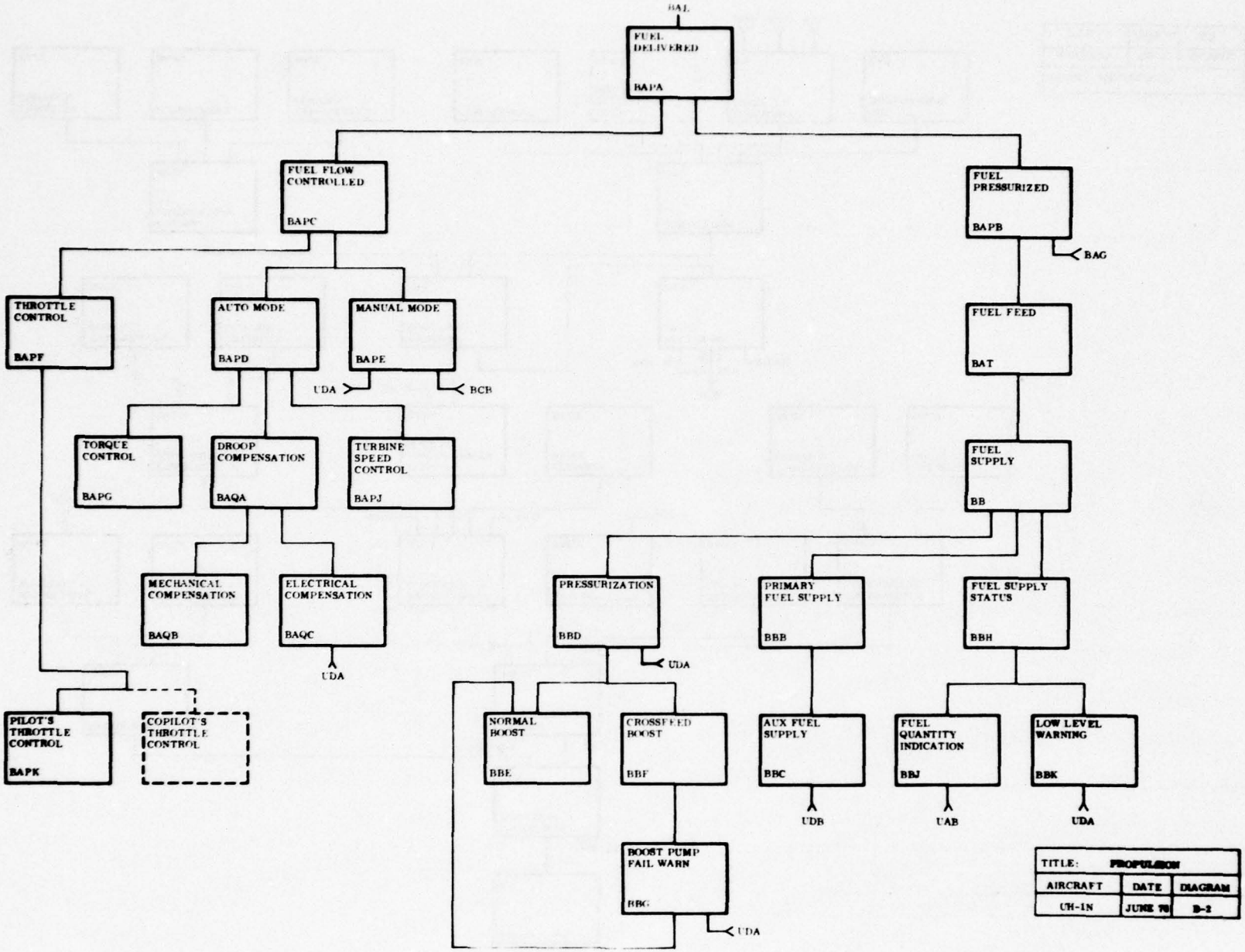
The diagrams illustrating the functional relationships considered in the UH-1N safety model are presented on pages D-5 through D-19, and are listed below:

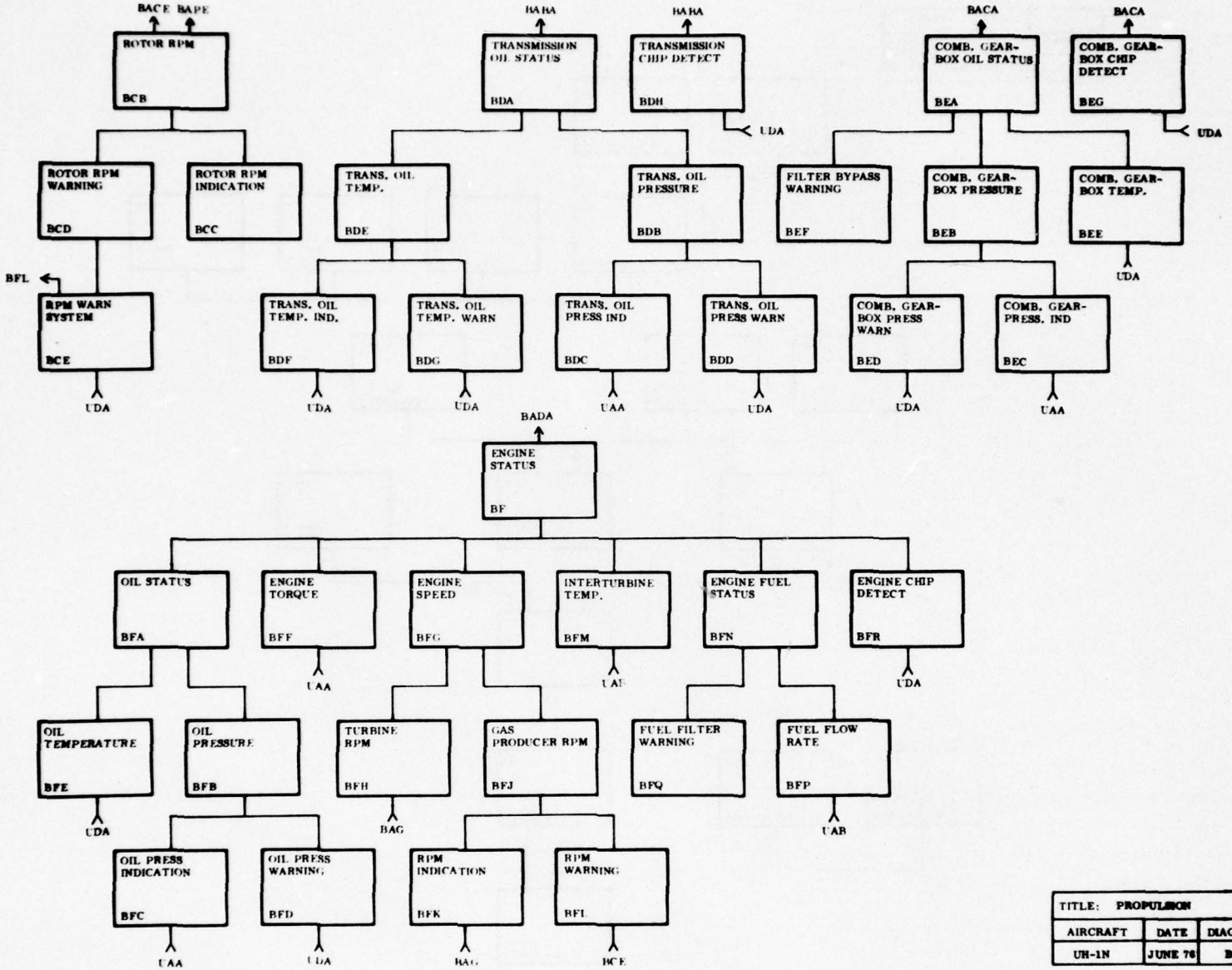
D.2 CARD LISTING

Pages D-21 through D-54 are a reproduction of the punchcard listing. The listing is alphabetical by "alpha designator", and the format is that of the 80-column punchcard itself as described in Appendix C. At the top of each page the card columns are printed vertically; for example, column 34 is printed "$\frac{3}{4}$".

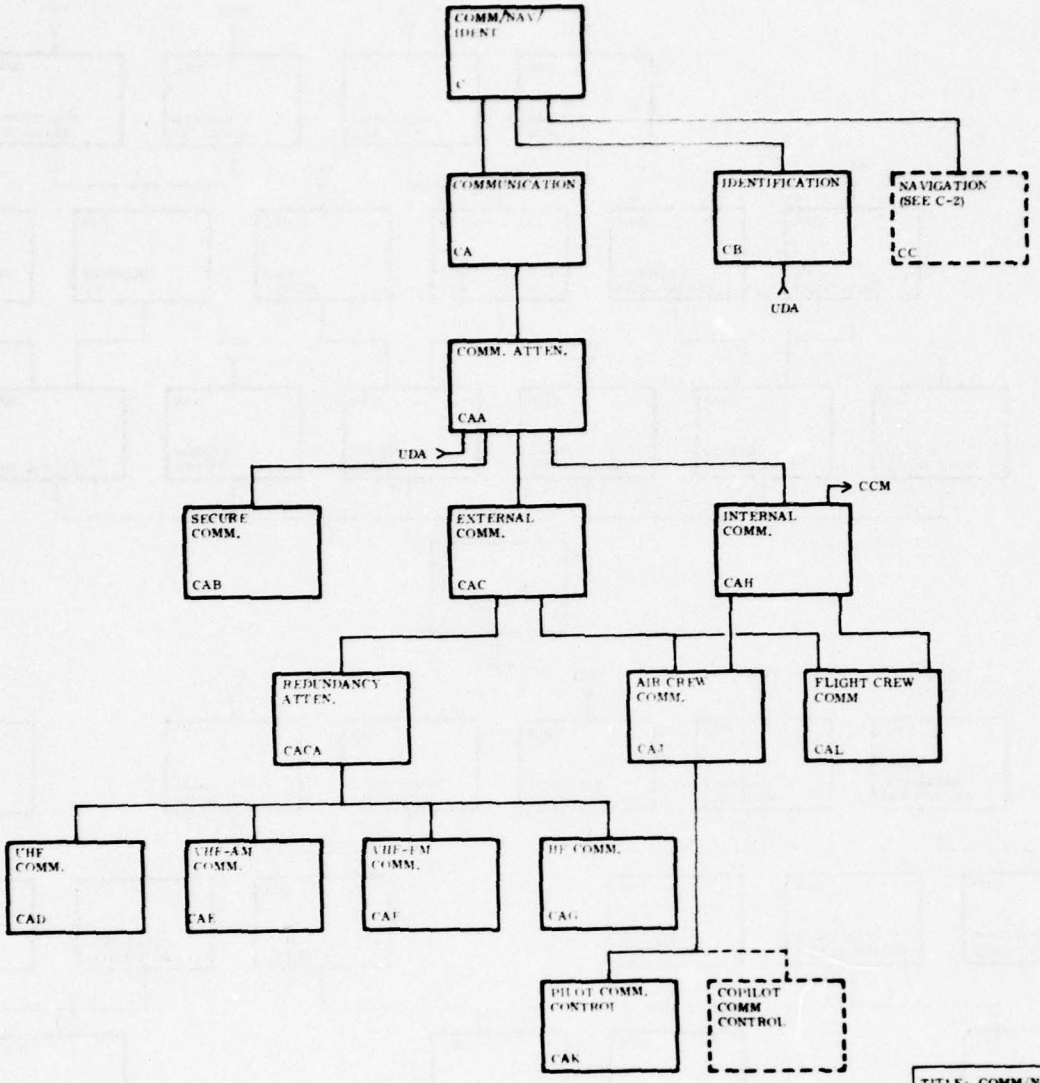


TITLE: PROPULSION		
AIRCRAFT	DATE	DIAGRAM
UH-1N	JUNE 76	B-1

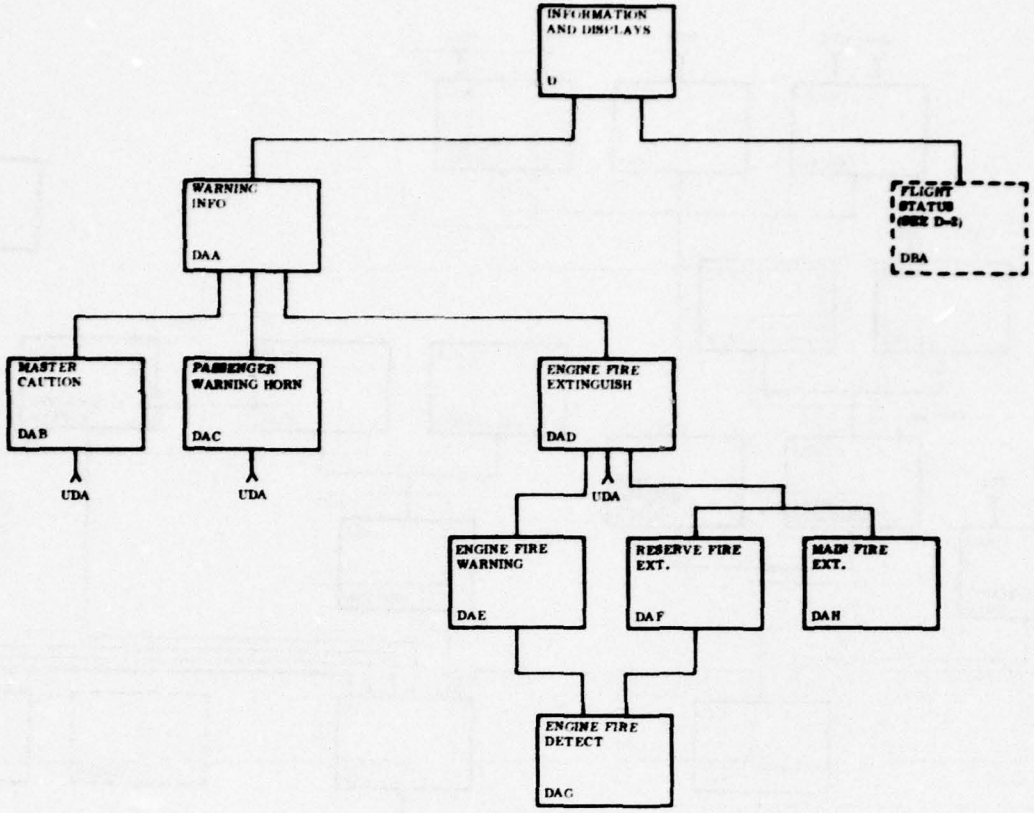

BAL
FUEL DELIVERED
BAPA
FUEL FLOW CONTROLLED
BAPC
FUEL PRESSURIZED
BAPB
BAG
THROTTLE CONTROL
BAPF
AUTO MODE
BAPD
MANUAL MODE
BAPE
UDA
BCB
FUEL FEED
BAT
TORQUE CONTROL
BAPG
DROOP COMPENSATION
BAQA
TURBINE SPEED CONTROL
BAPJ
FUEL SUPPLY
BB
MECHANICAL COMPENSATION
BAQB
ELECTRICAL COMPENSATION
BAQC
UDA
PRESSURIZATION
BBD
UDA
PRIMARY FUEL SUPPLY
BBB
FUEL SUPPLY STATUS
BBH
PILOT'S THROTTLE CONTROL
BAPK
COPILOT'S THROTTLE CONTROL
NORMAL BOOST
BBE
CROSSFEED BOOST
BBF
AUX FUEL SUPPLY
BBC
UDB
FUEL QUANTITY INDICATION
BBJ
UAB
LOW LEVEL WARNING
BBK
UDA
BOOST PUMP FAIL WARN
BBG
UDA
TITLE: PROPULSION
AIRCRAFT
DATE
DIAGRAM
UH-1N
JUNE 70
B-2



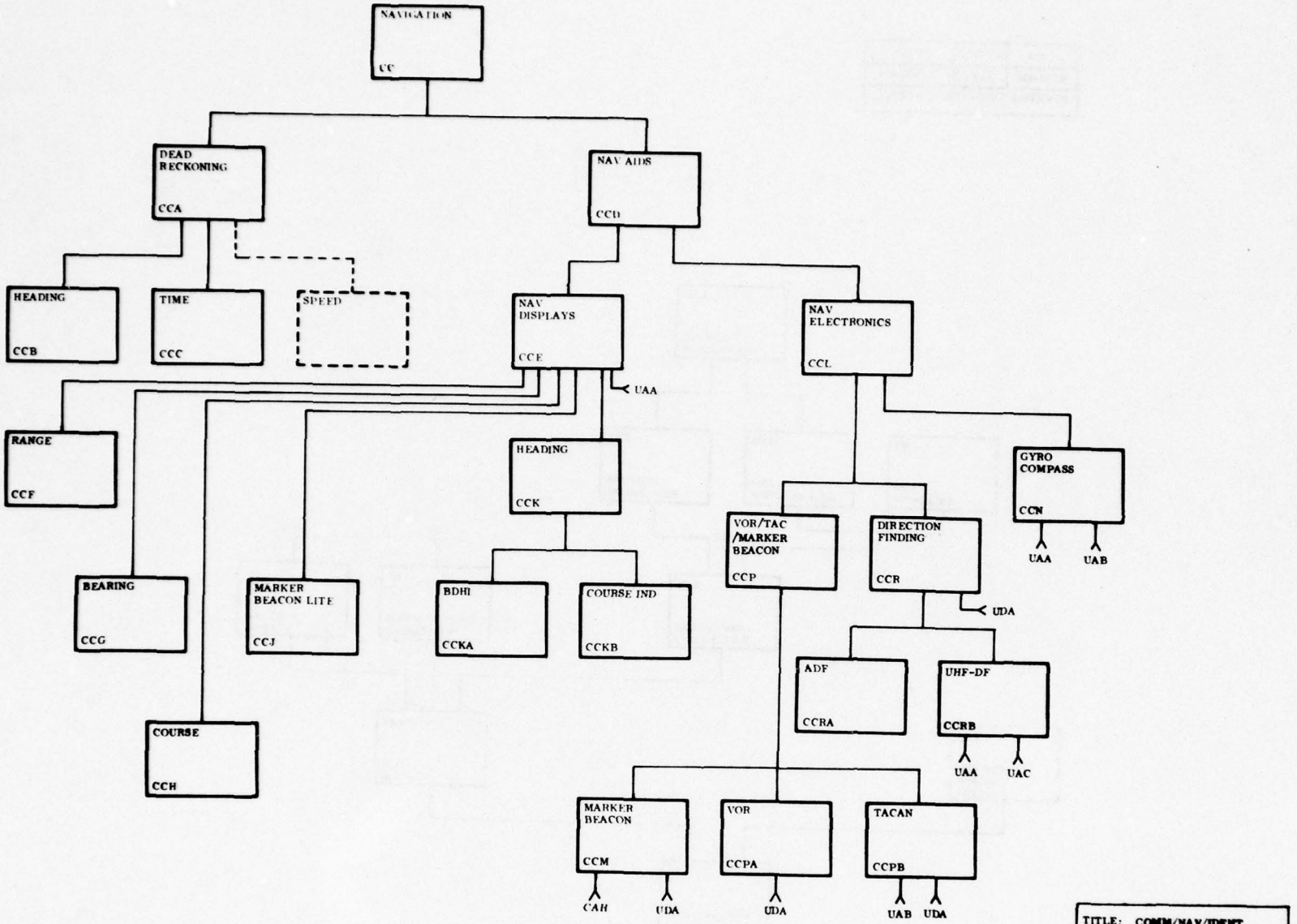
TITLE: PROPULSION		
AIRCRAFT	DATE	DIAGRAM
UH-1N	JUNE 76	B-3



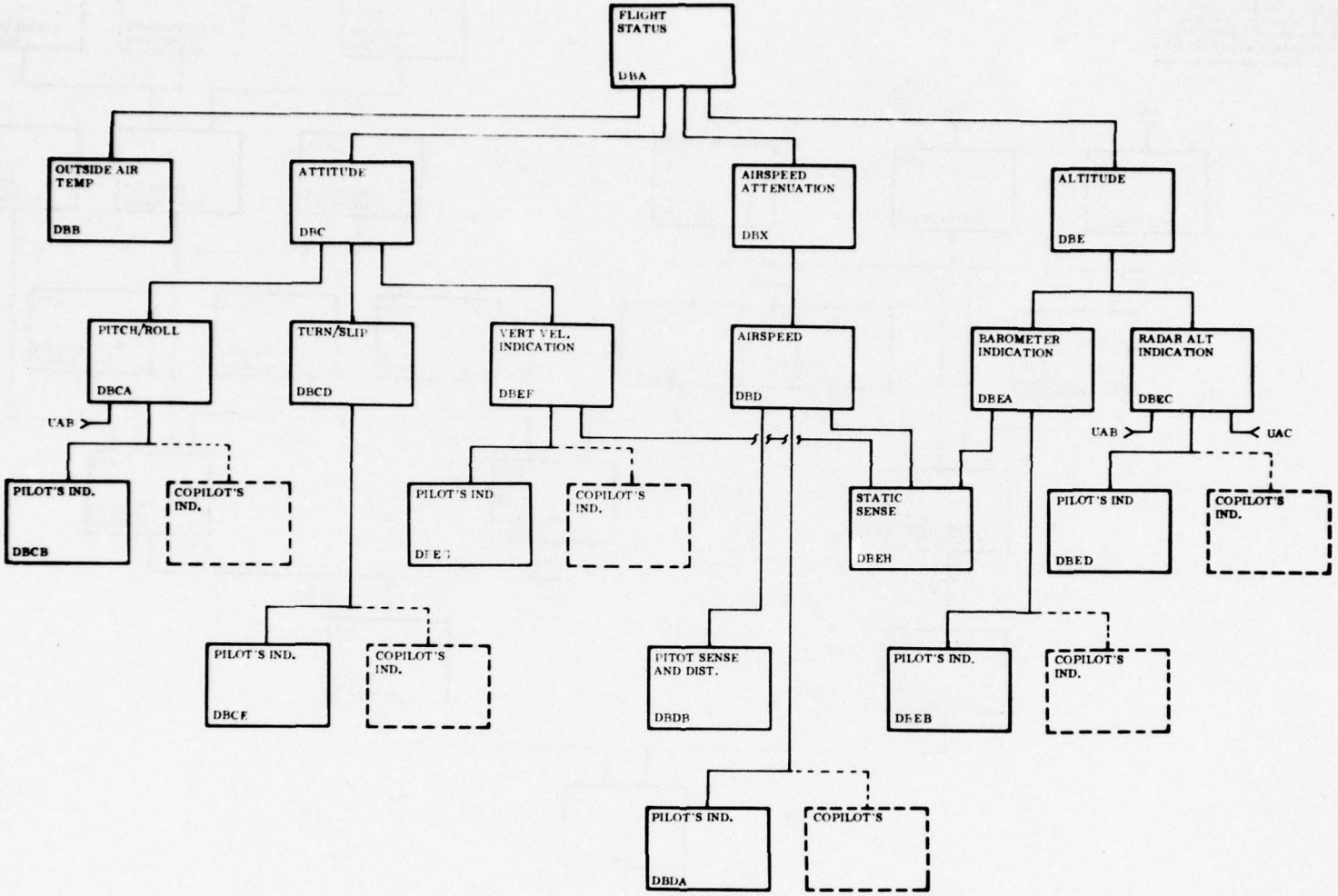
TITLE: COMM/NAV/IDENT		
AIRCRAFT	DATE	DIAGRAM
UH-1N	JUNE 76	C-1



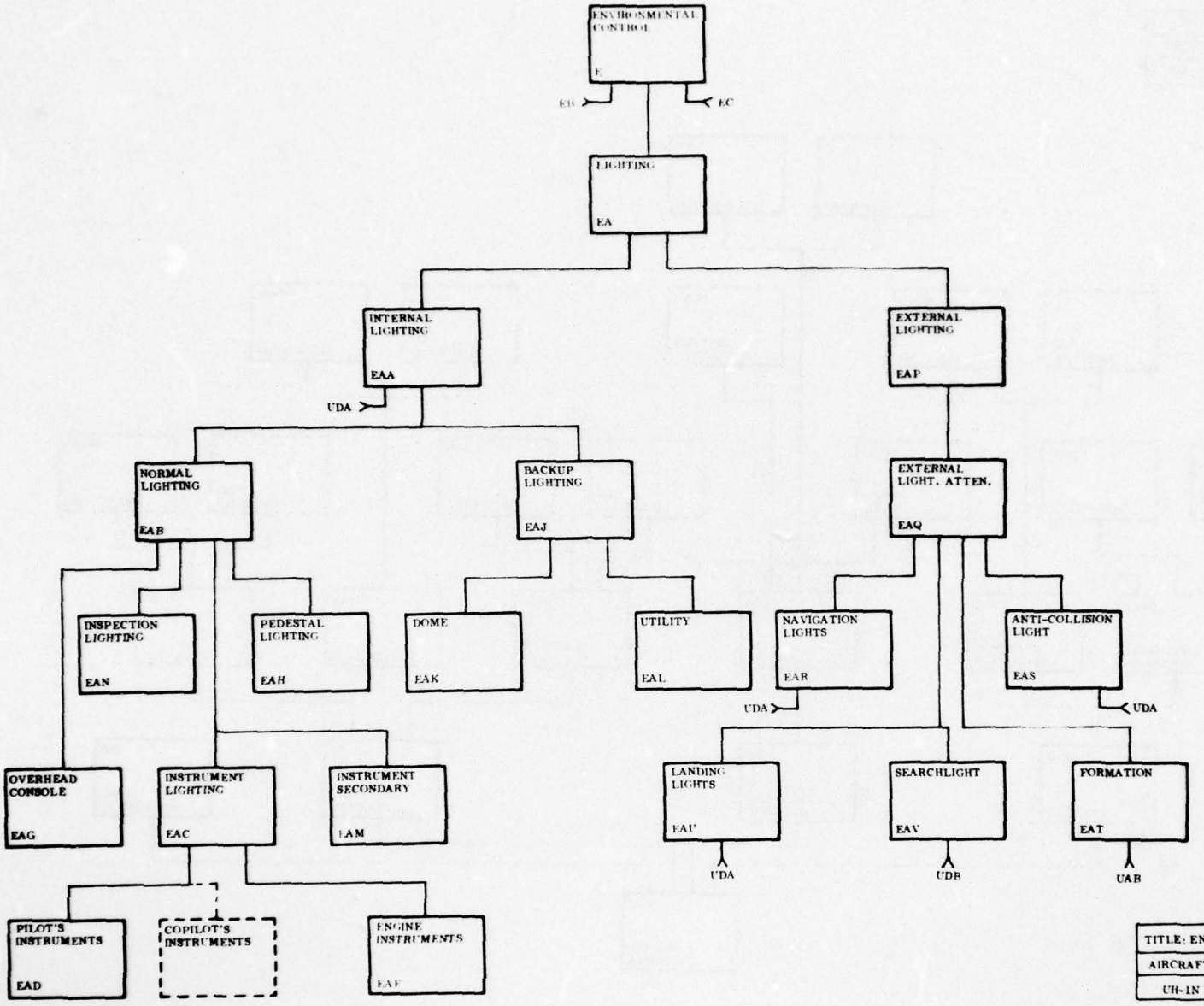
TITLE: INFORMATION & DISPLAYS		
AIRCRAFT	DATE	DIAGRAM
UH-1N	JUNE 76	D-1



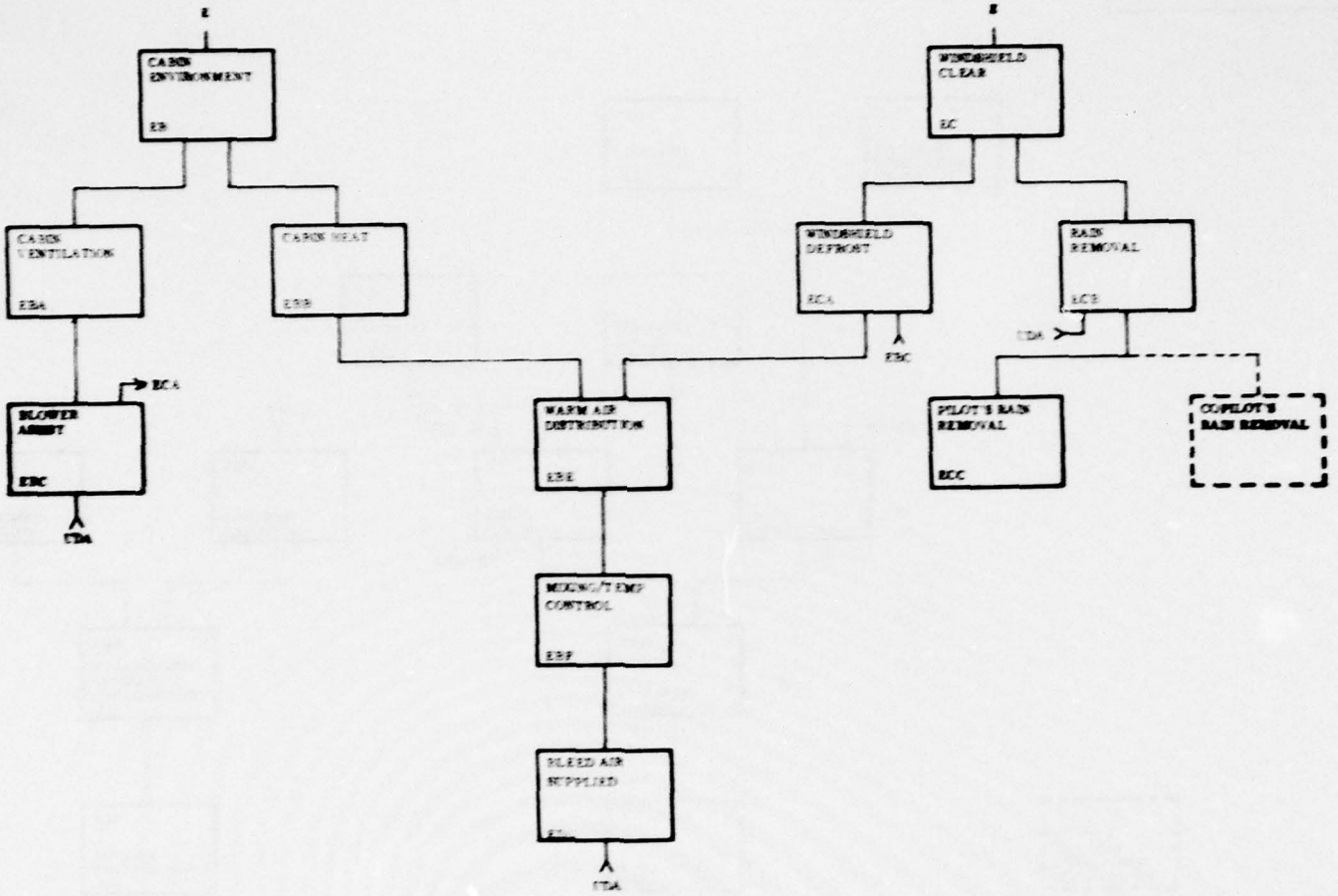
TITLE: COMM/NAV/IDENT		
AIRCRAFT	DATE	DIAGRAM
UH-1N	JUNE 76	C-2



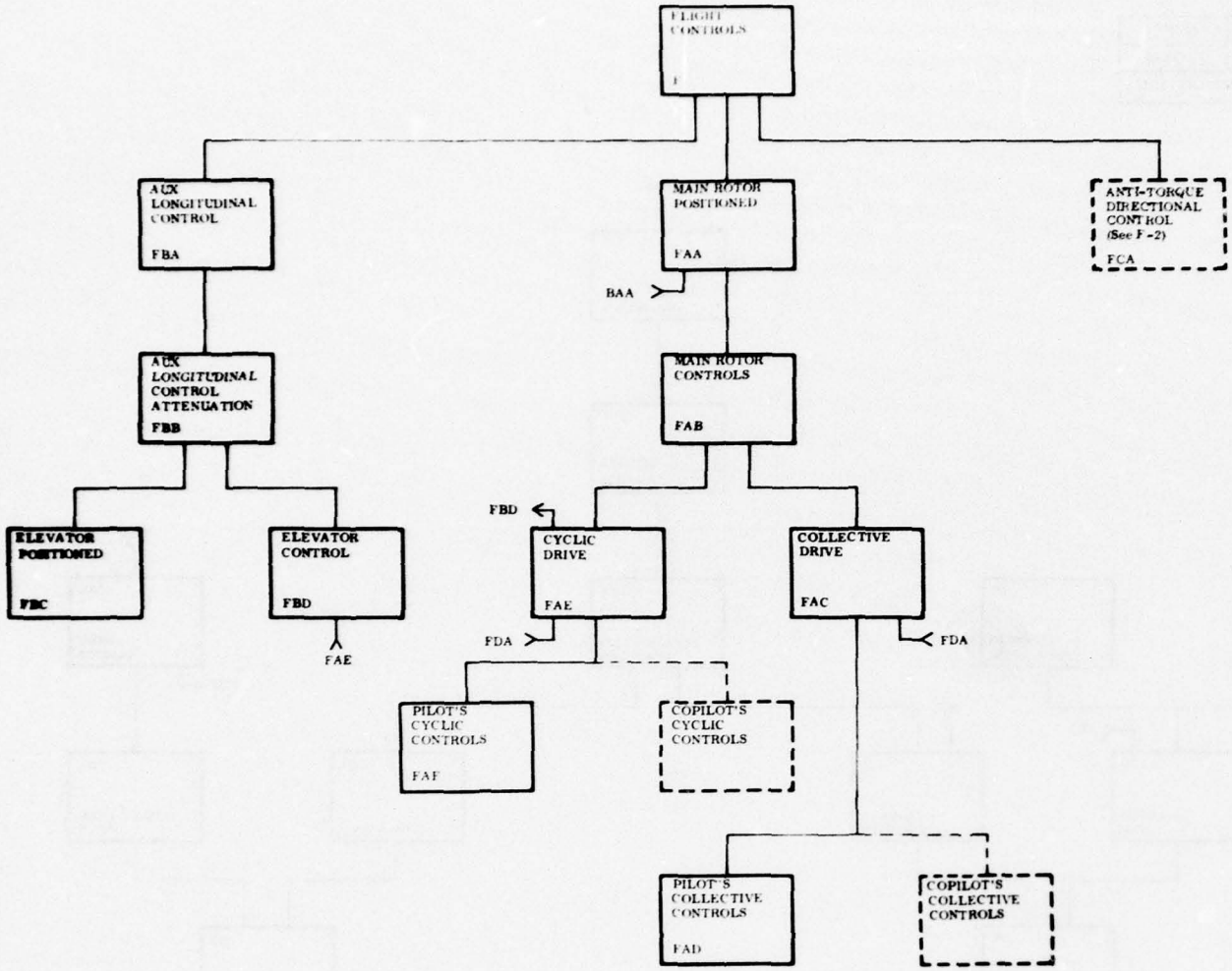
TITLE: INFORMATION & DISPLAYS		
AIRCRAFT	DATE	DIAGRAM
UH-1N	JUNE 76	D-2



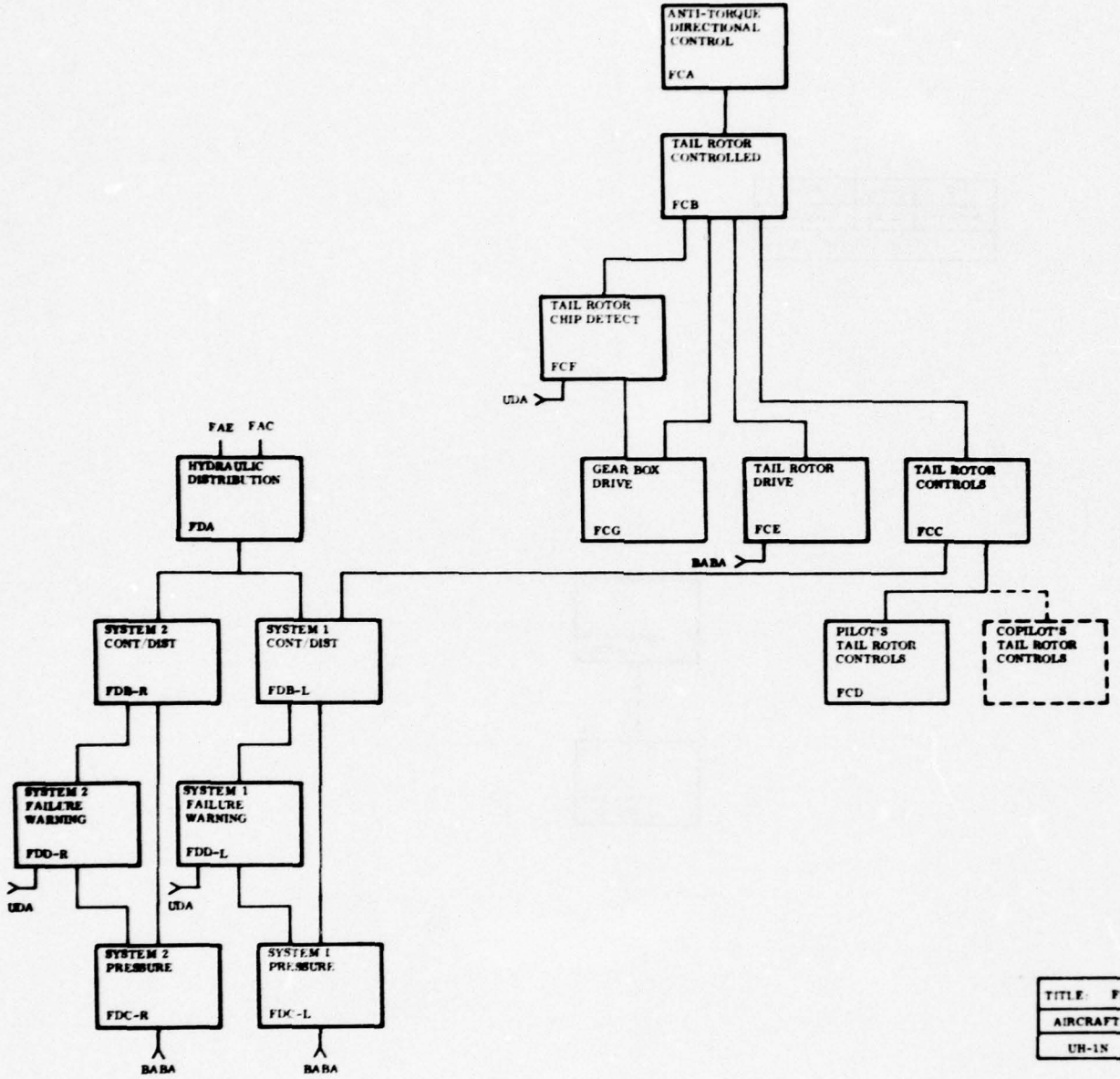
TITLE: ENVIRONMENTAL CONTROL		
AIRCRAFT	DATE	DIAGRAM
UH-1N	JUNE 78	E-1



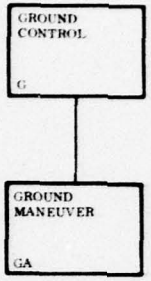
TITLE: ENVIRONMENTAL CONTROL		
AIRCRAFT	DATE	DIAGRAM
UH-1N	JUNE 74	E-2



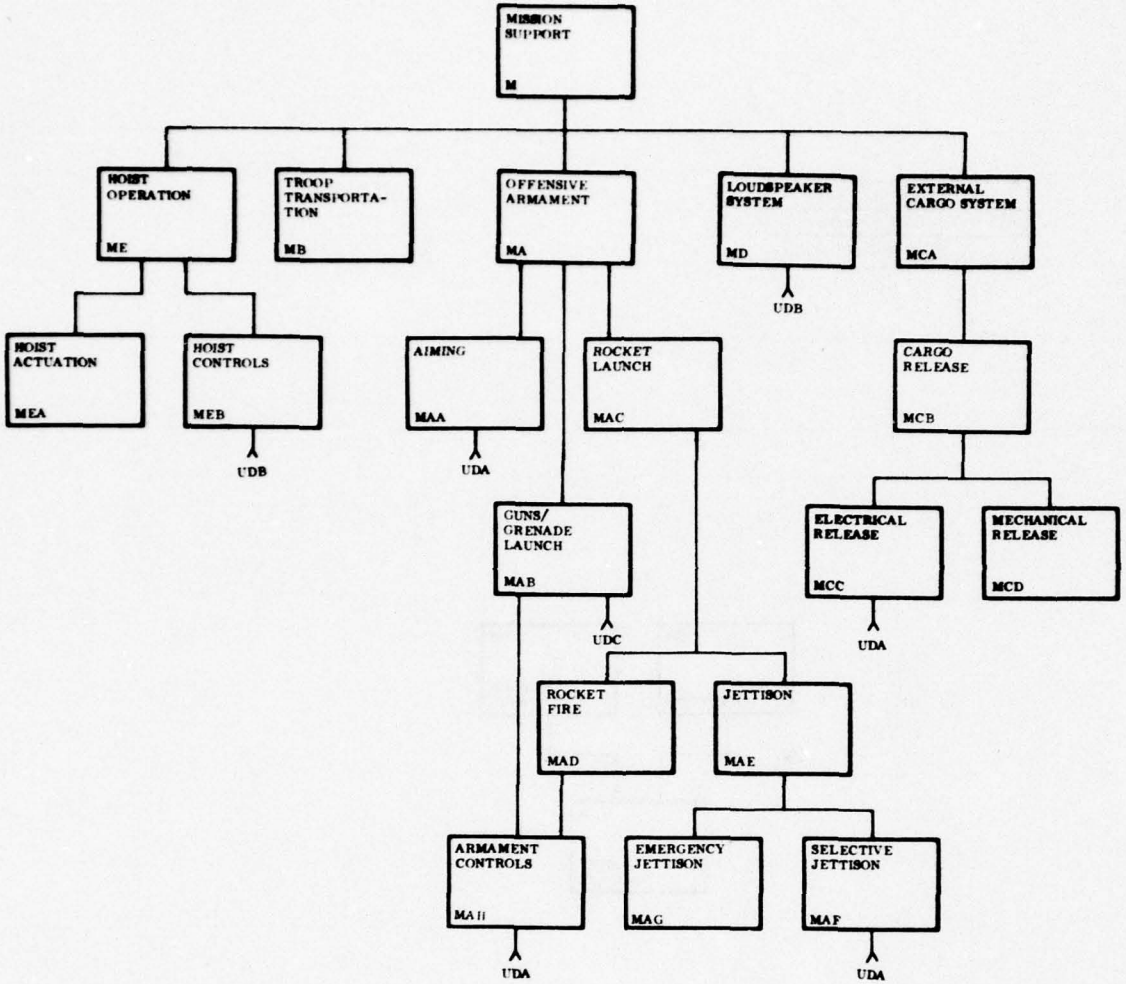
TITLE: FLIGHT CONTROL		
AIRCRAFT	DATE	DIAGRAM
UH-1N	JUNE 76	F-1



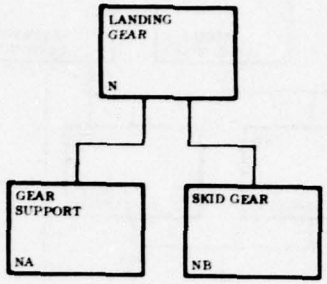
TITLE: FLIGHT CONTROL		
AIRCRAFT	DATE	DIAGRAM
UH-1N	JUNE 76	F-2



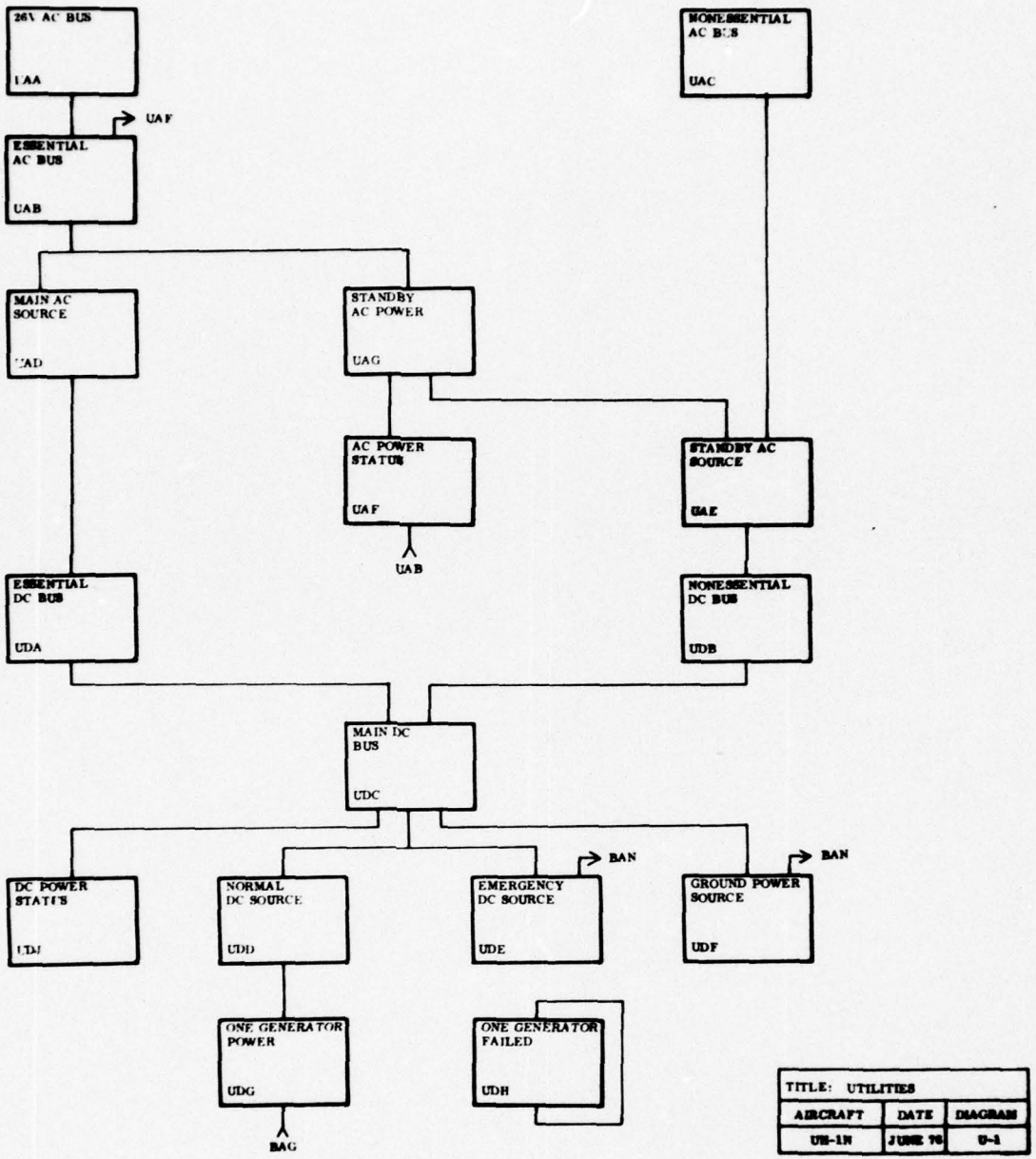
TITLE: GROUND CONTROL		
AIRCRAFT	DATE	DIAGRAM
UH-1N	JUNE 76	G-1



TITLE: MISSION SUPPORT		
AIRCRAFT	DATE	DIAGRAM
UH-1N	JUNE 76	M-1



TITLE: LANDING GEAR		
AIRCRAFT	DATE	DIAGRAM
UH-1N	JUNE 76	N-1



TITLE: UTILITIES		
AIRCRAFT	DATE	DIAGRAM
UH-1N	JUNE 76	U-1

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12345678901234567890123456789012345678901234567890123456789012345678901234567890
PGG095.J1CC UH01N   HIN
HIN PROPULSION                          B                       AAAAAAAAA
HIN ROTOR MAST ROTATION                 BAA             B       0BAAAAA80
HIN ROTOR MAST ROTATION                 BAA             FAA     FAAAAAAAAA
HIN  MAST ASSY          151G0   BAAA    BAA     1
HIN  DUST BOOT          151GA   BAAB    BAA     0
HIN  MAST               151GB   BAAC    BAA     A
HIN  COVER PLATE        151GC   BAAD    BAA     A
HIN  OIL JET            151GD   BAAE    BAA     2
HIN  UPPER BEARING      151GE   BAAF    BAA     A
HIN  BEARING LINER      151GF   BAAG    BAA     5
HIN  LOWER BEARING RACE 151GG   BAAH    BAA     5
HIN POWER TRANSMISSION                  BABA    BAA             AAAAAAAAA
HIN POWER TRANSMISSION                  BABA    FCF             FAAAAAAAAA
HIN POWER TRANSMISSION                  BABA    LFDC            FAAAAAAAAA
HIN POWER TRANSMISSION                  BABA    RFDC            FAAAAAAAAA
HIN ROTOR BRAKE ENGAGED                 BABB    BAA             0C0000000
HIN  ROTOR BRAKE QUILL  2611E   BABBA   BABB    A
HIN  ROTOR BRAKE HOUSING 2611F  BABBB   BABB    0
HIN  ROTOR BRAKE LINING 2611G   BABBC   BABB    1
HIN  ROTOR BRAKE DISC   2611H   BABBD   BABB    1
HIN ROTOR BRAKE HYD POWER               BABC    BABB            AAAAAAAAA
HIN  ROTOR BRAKE HYD SYSTEM 4520C BABCA BABC    0
HIN  MASTER CYLINDER    4521A   BABCB   BABC    8
HIN  FILLER PLUG        4521B   BABCC   BABC    1
HIN  COUPLING HALF      4521C   BABCD   BABC    3
HIN TRANSMISSION LUBRICATION            BABD    BABA            00668660
HIN  INTERNAL FILTER    2612B   BABDA   BABD    1
HIN  MANIFOLD           2612C   BABDB   BABD    1
HIN  JETS               2612D   BABDC   BABD    1
HIN  EXTERNAL FILTER    2612F   BABDD   BABD    1
HIN  FILTER ELEMENT     2612G   BABDE   BABD    1
HIN  FILLER CAP         2612H   BABDF   BABD    1
HIN  SIGHT GAGE         2612J   BABDG   BABD    0
HIN  DRAIN VALVE        2612K   BABDH   BABD    1
HIN PRESSURE CONTROL                    BABE    BABD            029AAA920
HIN  PUMP               2612A   BABEA   BABE    8
HIN  RELIEF VALVE       2612L   BABEB   BABE    1
HIN TEMPERATURE CONTROL                 BABF    BABD            000111000
HIN  BLOWER SHAFT 2 EACH 22AAL  BABFA   BABF    1
HIN  BLOWER SHAFT 2 EA  22AAL   BABFA   BACD    1
HIN  BLOWER SHAFT 2 EA  22AAL   BABFA   BAJD    1
HIN  COOLER             2612E   BABFB   BABF    1
HIN  THERMOSTAT VALVE   2612M   BABFC   BABF    1
HIN  BLOWER 2 EACH      22AGU   BABFD   BABF    1
HIN  OIL COOLER BLOWER 2 EA 22AGU BABFD BACD    1
HIN  OIL COOLER BLOWER 2 EA 22AGU BABFD BAJD    1
HIN ROTOR BRAKE WARNING                 BABG    BABB            111111111
HIN  PRESSURE SWITCH    4521C   BABGA   BABG    A
HIN  SEGMENT            4432E   BABGH   BABG    A
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123456789012345678901234567890123456789012345678901234567890123456789012345678
H1N  LAMP                          4432F   BAPGJ          BABG          A
H1N  TRANSMISSION DRIVE                    BABH           BABA                AAAAAAAAA
H1N  TRANSMISSION ASSY             2611C   BABHA          BABH          1
H1N  TRANSMISSION MOUNT ASSY       2614C   BABHC          BABH          0
H1N  BUSHING                       2614A   BABHD          BABH          0
H1N  BOOT                          2614B   BABHE          BABH          0
H1N  MOUNT                         2614C   BABHF          BABH          8
H1N  SPACER PLATE                  2614D   BABHG          BABH          1
H1N  BOLT                          2614E   BABHH          BABH          5
H1N  DAMPER                        2614F   BABHJ          BABH          1
H1N  FIFTH MOUNT                   2615D   BABHK          BABH          3
H1N  BEARING                       2615A   BABHL          BABH          1
H1N  BOLT                          2615B   BABHM          BABH          3
H1N  BOOT                          2615C   BABHN          BABH          0
H1N  ISOLATION MOUNT               2615D   BABHP          BABH          1
H1N  FITTING                       2615E   BABHQ          BABH          1
H1N ENGINE POWER COMBINED                  BACA           BABA      BACE      017121310
H1N ENGINE POWER COMBINED                  BACA           BABA  B           0000A0000
H1N ENGINE POWER COMBINED                  BACA           BABA  C           00ACACA0C
H1N  INPUT DRIVE QUILL             2611A   BACAV          BACA          A
H1N COMBINING GEARBOX LUBE                 BACB           BACA                0066866C0
H1N  LUBE SYSTEM                   22AGC   BACBA          BACB          0
H1N  ELEMENT OIL FILTER            22AGF   BACBB          BACB          0
H1N  VALVE FILTER BYPASS           22AGH   BACBC          BACB          1
H1N  TANK FILTER AND CAP           22AGM   BACBD          BACB          1
H1N  OIL LEVEL SIGHT GAGE          22AGN   BACBE          BACB          0
H1N  OIL TUBE PRESSURE             22AGS   BACBF          BACB          1
H1N  OIL TUBE BREATHER             22AGD   BACBG          BACB          1
H1N  STATIC CHECK VALVE            22AGR   BACBH          BACB          1
H1N PRESSURE CONTROL                       BACC           BACB                029AAA920
H1N  OIL PUMP                      22AGB   BACCA          BACC          A
H1N  REGULATOR                     22AGG   BACCB          BACC          8
H1N TEMPERATURE CONTROL                    BACD           BACB                0C0111000
H1N  OIL COOLER                    22AGT   BACDA          BACD          1
H1N AUTOROTATION                           BACE           BABA  K BACA      0CAAAAA0C
H1N  INPUT DRIVE QUILL             2611A   BACEA          BACE          A
H1N GEARBOX DRIVE                          BACF           BACA                AAAAAAAAA
H1N  REDUCTION GEARBOX SECTION     22AAC   BACFA          BACF          1
H1N  OUTPUT HOUSING                22AAA   BACFB          BACF          1
H1N  DIAPHRAGM                     22AAB   BACFC          BACF          1
H1N  INPUT HOUSING                 22AAC   BACFD          BACF          1
H1N  3RD  STAGE GEAR               22AAF   BACFG          BACF          A
H1N  OUTPUT SHAFT                  22AAH   BACFJ          BACF          A
H1N  IDLER GEAR                    22AAK   BACFK          BACF          A
H1N  PADS COVERS                   22AAM   BACFL          BACF          1
H1N  OUTPUT CARBON SEAL            22AAN   BACFM          BACF          1
H1N  TACH GENERATOR SEAL           22AAP   BACFN          BACF          1
H1N  MAIN DRIVE SHAFT ASSY         2621C   BACFP          BACF          1
H1N  SHAFT                         2621A   BACFQ          BACF          A
H1N  COUPLING                      2621B   BACFR          BACF          A
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0000000001111111111222222233333333334444444445555555556666666666777777777
1234567890123456789012345678901234567890123456789012345678901234567890123456789
MIN  ADAPTER                          2621C    BACFS          BACF          A
MIN  BOOT                             2621D    BACFT          BACF          J
MIN  HOUSING                          2621E    BACFU          BACF          1
MIN SINGLE ENGINE POWER TOF2                   BADA           BACA            0ABIA13A0
MIN  VERT TUBE  FWD ENG MT            11FCA    BADAA          BADA          A
MIN  HORIZ TUBE FWD ENG MT            11FCB    BADAB          BADA          8
MIN  BEARING                          11FCC    BADAC          BADA          1
MIN  UPPER FITTING                    11FCD    BADAD          BADA          8
MIN  LOWER FITTING                    11FCE    BADAE          BADA          8
MIN  STOP FITTING                     11FCF    BADAF          BADA          1
MIN  BIPOD ASSY                       11FDC    BADAG          BADA          1
MIN  TUBE                             11FDA    BADAH          BADA          A
MIN  BEARING                          11FDB    BADAJ          BADA          1
MIN  FITTING                          11FDC    BADAK          BADA          8
MIN  TRIPOD ASSY                      11FEC    BADAL          BADA          1
MIN  TUBE                             11FEA    BADAM          BADA          A
MIN  BEARING                          11FEB    BADAN          BADA          1
MIN  FITTING                          11FEC    BADAP          BADA          8
MIN  INPUT GEARS 1ST STAGE            22AAD    BADAQ          BADA          A
MIN  2ND STAGE GEARS                  22AAE    BADAR          BADA          A
MIN  CLUTCH GEARSHAFT                 22AAG    BADAS          BADA          A
MIN TURBINE ROTATION                           BAF            BADA            AAAAAAAAA
MIN TURBINE ROTATION                           BAF            BAG             FAAAAAAAAA
MIN  TURBINE SECTION                  22AEC    BAFA           BAF           C
MIN  COMP TURB VANE RING              22AEB    BAFB           BAF           A
MIN  COMP TURB DISC                   22AEC    BAFC           BAF           A
MIN  COMP TURB BLADE                  22AED    BAFD           BAF           A
MIN  COMP TURB SHROUD SEGMT           22AEE    BAFE           BAF           2
MIN  INTERSTAGE BAFFLE                22AFF    BAFF           BAF           2
MIN  POWER TURBINE VANE RING          22AEG    BAFG           BAF           A
MIN  POWER TURBINE SHROUD             22AEH    BAFH           BAF           2
MIN  POWER TURBINE BLADE              22AEJ    BAFJ           BAF           A
MIN  POWER TURBINE ROTOR              22AEK    BAFK           BAF           A
MIN  POWER TURBINE STATOR HGS         22AEL    BAFL           BAF           A
MIN  POWER TURBINE SHAFT HGS          22AEM    BAFM           BAF           A
MIN  NO 3 BEARING                     22AEN    BAFN           BAF           8
MIN  POWER TURBINE DISC               22AEP    BAFP           BAF           A
MIN  NO 4 BEARING                     22AEQ    BAFQ           BAF           8
MIN  TURB STUB SHAFT BOLT             22AER    BAFR           BAF           A
MIN  NO 3 AND 4 BEARING SUPPORT       22AES    BAFS           BAF           A
MIN  COUPLING SHAFT                   22AET    BAFT           BAF           A
MIN ACCESSORY DRIVE                            BAG            BADA            SAAAAAAAAA
MIN ACCESSORY DRIVE                            BAG            BAN             FAAAAAAAAA
MIN ACCESSORY DRIVE                            BAG            BAPR            FAAAAAAAAA
MIN ACCESSORY DRIVE                            BAG            BFH             FAAAAAAAAA
MIN ACCESSORY DRIVE                            BAG            BFK             FAAAAAAAAA
MIN ACCESSORY DRIVE                            BAG            UDG               AAAAAAAAA
MIN  ASSY GEARBOX SYS                 22ALC    BAGA           BAG           0
MIN  FRT HOUSING CASE                 22ALB    BAGB           BAG           1
MIN  COVER HOUSING CASE               22ALC    BAGC           BAG           0
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000000300111111111122222222233333333344444444445555555556666666667777777778
123456789012345678901234567890123456789012345678901234567890123456789012345690
HIN  FIRESEAL RING                22ALD   BAGD          BAG      1
HIN  INPUT COUPLING SHAFT         22ALE   BAGE          BAG      A
HIN  IDLER GEAR SHAFT             22ALF   BAGF          BAG      A
HIN  AIR/OIL SEPARATOR            22ALJ   BAGG          BAG      J
HIN  BEARING                      22ALK   BAGH          BAG      A
HIN  CARBON SEAL                  22ALL   BAGJ          BAG      1
HIN  PADS COVERS                  22ALM   BAGL          BAG      0
HIN  SEAL SHAFT                   22ALN   BAGM          BAG      1
HIN  PACKING O-RING               22ALP   BAGN          BAG      1
HIN  LIFTING BRACKET              22ALQ   BAGP          BAG      0
HIN  TUBE OIL TRANSFER            22ALS   BAGQ          BAG      8
HIN ENGINE LUBRICATION                    BAJA          BAF        000111000
HIN  LUBRICATION SYSTEM           22AGC   BAJAA         BAJA     0
HIN SUPPLY/DISTRIBUTION                   BAJB          BAJA       AAAAAAAAA
HIN  PUMP OIL SCAV NO 2           22AGC   BAJBA         BAJB     5
HIN  PUMP OIL SCAV NO 3/4 BEAR    22AGD   BAJBB         BAJB     5
HIN  PUMP EJECTOR                 22AGE   BAJBC         BAJB     5
HIN  ELEMENT OIL FILTER           22AGF   BAJBD         BAJB     0
HIN  VALVE FILTER BYPASS          22AGH   BAJBE         BAJB     1
HIN  TANK FILTER AND CAP          22AGM   BAJBF         BAJB     1
HIN  OIL LEVEL SIGHT GAGE         22AGN   BAJBG         BAJB     0
HIN  OIL TUBE SCAVENGE            22AGP   BAJBH         BAJB     1
HIN  OIL TUBE BREATHER            22AGQ   BAJBJ         BAJB     0
HIN  STATIC CHECK VALVE           22AGR   BAJBK         BAJB     0
HIN  OIL TUBE PRESSURE            22AGS   BAJBL         BAJB     1
HIN PRESSURE CONTROL                      BAJC          BAJA       AAAAAAAAA
HIN  PUMP OIL PRESSURE            22AGB   BAJCA         BAJC     A
HIN  REGULATOR PRESSURE           22AGG   BAJCB         BAJC     2
HIN TEMPERATURE CONTROL                   BAJD          BAJA       111111111
HIN  OIL COOLER                   22AGT   BAJDA         BAJD     1
HIN COMBUSTION                            BAL           BAF        AAAAAAAAA
HIN  COMB SECTION                 22ADO   BALA          BAL      0
HIN  COMB CHAMBER LINER           22ADB   BALB          BAL      A
HIN  GAS GENERATOR CASE           22ADC   BALC          BAL      A
HIN  COMB DRAIN VALVE             22ADD   BALD          BAL      0
HIN  OUTER EXIT DUCT              22ADE   BALE          BAL      1
HIN  INNER EXIT DUCT              22ADF   BALF          BAL      1
HIN COMPRESSION                           BAM           BAL        AAAAAAAAA
HIN  COMPRESSOR SECTION           22ABO   BAMA          BAM      0
HIN  INLET SCREEN                 22ABB   BAMB          BAM      1
HIN  INTAKE SCREEN SUPPORT        22ABC   BAMC          BAM      1
HIN  FIRESEAL RING                22ABD   BAMD          BAM      A
HIN  COMP INLET CASE              22ABE   BAME          BAM      1
HIN  COMP HOUSING                 22ABF   BAMF          BAM      1
HIN  LABRYINTH SEAL               22ABG   BAMG          BAM      1
HIN  NO.1 BEARING                 22ABH   BAMH          BAM      8
HIN  SPACER                       22ABJ   BAMJ          BAM      8
HIN  COMP ROTOR ASSY              22ACO   BAMK          BAM      0
HIN  1ST ROTOR BLADES             22ACB   BAML          BAM      A
HIN  1ST STATOR VANES             22ACC   BAMM          BAM      A
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1234567890123456789012345678901234567890123456789012345678901234567890123456789012
HIN  2ND ROTOR BLADES              22ACD   BAMN          BAM          A
HIN  2ND STATOR VANES              22ACE   BAMP          BAM          A
HIN  3RD ROTOR BLADES              22ACF   BAMQ          BAM          A
HIN  3RD STATOR VANES              22ACG   BAMR          BAM          A
HIN  SPACER                        22ACH   BAMS          BAM          8
HIN  COMP REAR HUB                 22ACJ   BAMT          BAM          A
HIN  IMPELLER                      22ACK   BAMU          BAM          A
HIN  IMPELLER HOUSING              22ACL   BAMV          BAM          A
HIN  COMP TIE ROD                  22ACN   BAMW          BAM          A
HIN  VANE RING                     22ACP   BAMX          BAM          A
HIN  NO 2 BEARING                  22ACQ   BAMY          BAM          8
HIN  AIR ROTOR SEAL                22ACR   BAMZ          BAM          1
HIN  COMPRESSOR BLEED VALVE        22AKD   BAMZA         BAM          1
HIN IGNITION/START                         BAN           BAL    T          OOOAAAOOO
HIN  IGNITION AND ELECT SYSTEM     22AJD   BANA          BAN          0
HIN  IGN EXCITOR BOX               22AJB   BANB          BAN          A
HIN  PLUG IGNITOR 2 EACH           22AJC   BANC          BAN          2
HIN  IGNITION HARNESS              22AJE   BAND          BAN          5
HIN  STARTER GENERATOR             4211K   BANE          BAN          A
HIN  START GEN CONT RELAY          4211T   BANF          BAN          A
HIN  SHUNT CONT RELAY              4211U   BANG          BAN          A
HIN  ENGINE START SWITCH           9942A   BANH          BAN          A
HIN  CIRCUIT BREAKER               4221G   BANJ          BAN          1
HIN  STARTER GEARSHAFT             22ALG   BANK          BAN          A
HIN  FLOW DIVIDER                  22AHS   BANL          BAN          8
HIN FUEL DELIVERED                         BAPA          BAL               AAAAAAAAA
HIN  FUEL MANIFOLD ASSY            22AHK   BAPAA         BAPA         A
HIN  TUBE PRIMARY                  22AHL   BAPAB         BAPA         A
HIN  TUBE SECONDARY                22AHM   BAPAC         BAPA         1
HIN  FUEL NOZZLE                   22AHN   BAPAD         BAPA         1
HIN  FUEL TUBE PRESSURE            22AHQ   BAPAE         BAPA         A
HIN FUEL PRESSURIZED                       BAPB          BAPA              AAAAAAAAA
HIN  FUEL PUMP                     22AHD   BAPBA         BAPB         A
HIN  FILTER FUEL ELEMENT           22AHE   BAPBB         BAPB         1
HIN  FUEL PUMP GEARSHAFT           22ALH   BAPBC         BAPB         A
HIN FUEL FLOW CONTROLLED                   BAPC          BAPA              AAAAAAAAA
HIN  FUEL SYSTEM                   22AHJ   BAPCA         BAPC         0
HIN AUTO MODE                              BAPD          BAPC    BAPE      111111111
HIN  FUEL CONTROL AUTO             22AHB   BAPDA         BAPD         8
HIN  REGULATOR VALVE               22AHF   BAPDB         BAPD         8
HIN  BYPASS VALVE                  22AHG   BAPDC         BAPD         5
HIN  TRANSFER VALVE MFC            22AHH   BAPDD         BAPD         1
HIN  T5 THERMOCOUPLE     DELET     22AJD   BAPDE         BAPD         0
HIN  T5 SENSING HARNESS DELET      22AJF   BAPDF         BAPD         0
HIN  T5 LIMITER                    22AJG   BAPDG         BAPD         0
HIN  PNEUMATIC SYSTEM              22AKJ   BAPDH         BAPD         0
HIN  GOVERNOR NG                   22AHJ   BAPDJ         BAPD         A
HIN  AIR TUBE P3 PRESSURE          22AKB   BAPDK         BAPD         8
;HIN TUBE COMPRESSOR DISCHARGE     22AKE   BAPDL         BAPD         8
HIN MANUAL MODE                            BAPE          BAPC   K BAPD    AAAAAAAAA
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0000000001111111112222222223333333444444444455555555566666666677777777789
1234567890123456789012345678901234567890123456789012345678901234567890123456789
HIN FUEL CONTROL MANUAL          22AHC   BAPEA    BAPE      A
HIN BYPASS VALVE                 22AHG   BAPEB    BAPE      5
HIN SOLENOID VALVE               22AHH   BAPEC    BAPE      A
HIN TRANSFER VALVE               22AHK   BAPED    BAPE      A
HIN  GOV MAN CONT CKT BKR        22CAN   BAPEE    BAPE      1
HIN THROTTLE CONTROL                     BAPF     BAPC        AAAAAAAAA
HIN  IDLE STOP CKT BKR           22CAN   BAPFP    BAPF      0
HIN TORQUE CONTROL                       BAPG     BAPD        AAAAAAAAA
HIN  TORQUE SYSTEM               22ANQ   BAPGA    BAPG      0
HIN  TORQUE CONTROL UNIT         22ANR   BAPGB    BAPG      8
HIN  TORQUE OIL TUBE             22ANC   BAPGC    BAPG      8
HIN  TORQUE CHAMBER              22AND   BAPGD    BAPG      8
HIN  AIR TUBE PG PRESSURE        22AKC   BAPGE    BAPG      8
HIN TURBINE SPEED CONTROL                BAPJ     BAPD        AAAAAAAAA
HIN  GOVERNOR SHAFT              22AAJ   BAPJA    BAPJ      A
HIN  POWER TURBINE GOVERNOR      22AAQ   BAPJB    BAPJ      A
HIN PILOTS THROTTLE CONTROL              BAPK     BAPF        111111111
HIN PILOTS THROTTLE CONTROL              BAPK     BAPF    H   AAAAAAAAA
HIN  POWER LEVER CONTROLS        22CAQ   BAPKA    BAPK      0
HIN  GRIP                        22CAA   BAPKB    BAPK      8
HIN  FLEXIBLE SHAFT              22CAB   BAPKC    BAPK      A
HIN  GEAR SECTOR                 22CAC   BAPKD    BAPK      A
HIN  CONTROL TUBE                22CAD   BAPKE    BAPF      A
HIN  BELLCRANK                   22CAE   BAPKF    BAPF      A
HIN  MOUNT                       22CAF   BAPKG    BAPF      1
HIN  JACKSHAFT                   22CAG   BAPKH    BAPF      A
HIN  TORQUE TUBE                 22CAH   BAPKJ    BAPF      A
HIN  PILLOW BLOCK                22CAJ   BAPKK    BAPF      1
HIN  IDLE STOP SOLENOID          22CAK   BAPKL    BAPF      0
HIN  IDLE STOP DELAY RELAY       22CAL   BAPKM    BAPF      0
HIN  IDLE STOP SWITCH            22CAM   BAPKN    BAPF      0
HIN DROOP COMPENSATION                   BAQA     BAPD        AAAAAAAAA
HIN  DROOP COMP CONTROLS         22CBJ   BAQAA    BAQA      0
HIN  ACTUATOR                    22CBF   BAQAB    BAQA      A
HIN MECHANICAL COMPENSATION              BAQB     BAQA        AAAAAAAAA
HIN  CONTROL TUBE                22CBA   BAQBA    BAQB      A
HIN  IDLER                       22CBB   BAQBB    BAQB      A
HIN  BELLCRANK                   22CBC   BAQBC    BAQB      A
HIN  BOOT                        22CBD   BAQBD    BAQB      0
HIN  CAMBOX                      22CBE   BAQBE    BAQB      2
HIN ELECTRICAL COMPENSATION              BAQC     BAQA        111111111
HIN  RPM SWITCH P2 FAC           22CBG   BAQCA    BAQC      5
HIN  GOV CONTROL CKT BKR         22CBH   BAQCB    BAQC      1
HIN AIR MANAGEMENT                       BAS      BAL         111000111
HIN AIR MANAGEMENT                       BAS      BAL     A   111111111
HIN  INLET FAIRING               11FAQ   BASA     BAS       0
HIN  INLET DUCT                  11FAR   BASB     BAS       0
HIN  INLET SCREEN                11FAS   BASC     BAS       1
HIN  INDUCTION BAFFLE            11FAT   BASD     BAS       0
HIN  PARTICLE SEPARATOR VALVE    11FAU   BASE     BAS       1
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12345678901234567890123456789012345678901234567890123456789012345678901234567890
HIN  PART SEPARATOR VALVE ACTUATING AV  BASF        BAS        5
HIN  EXHAUST SYSTEM                22FG  BASG        BAS        0
HIN  NINETY DEGREE EXHAUST DUCT 22AFA  BASH        BAS        0
HIN  EXHAUST DUCT ASSY             22AFB  BASJ        BAS        0
HIN  INNER DEFLECTOR RING          22AFC  BASK        BAS        0
HIN FUEL FEED                             BAT         BAPB         AAAAAAAAA
HIN  CONTROLS                      4614C  BATA        BAT        0
HIN  OIL/FUEL HEATER               22AHP  BATB        BAT        1
HIN  HEATED TUBE ASSY              22AHT  BATC        BAT        1
HIN  FUEL CONTROL HTR CKT BKR      4614B  BATD        BAT        0
HIN  FUEL SWITCH                   4614A  BATE        BAT        0
HIN  CIRCUIT BREAKER               4614B  BATF        BAT        0
HIN  SHUTOFF VALVE                 4612F  BATG        BAT        1
HIN  FILTER                        4612G  BATH        BAT        1
HIN  FILTER ELEMENT                4612H  BATJ        BAT        0
HIN  FILTER DRAIN VALVE            4612J  BATK        BAT        0
HIN FUEL SUPPLY                           BB          BACA         S111838811
HIN FUEL SUPPLY                           BB          BAT          FAAAAAAAAA
HIN PRIMARY FUEL SUPPLY                   BBB         BB           AAAAAAAAA
HIN  TANKS                         46110  BBBA        BBB        0
HIN  SELF SEALING CELL             4611A  BBBB        BBB        2
HIN  NON-SELF SEALING CELL         4611B  BBBC        BBB        1
HIN  SUMP 2 EACH                   4611C  BBBD        BBB        1
HIN  SUMP DRAIN VALVE 6 EACH       4611D  BBBE        BBB        1
HIN  CHECK VALVE                   4611G  BBBF        BBB        0
HIN  FLAPPER VALVE                 4611H  BBBG        BBB        0
HIN  EJECTOR PUMP                  4611J  BBBH        BBB        0
HIN  FIRE SUPPRESSION FOAM         4611K  BBBJ        BBB        0
HIN  FILLER NECK                   4611L  BBBK        BBB        0
HIN  FILLER CAP AND ADAPTER        4611M  BBBL        BBB        0
HIN  VENT LINE                     4611N  BBBM        BBB        1
HIN  ACCESS DOOR                   4611P  BBBN        BBB        0
HIN  HANGER                        4611S  BBBP        BBB        0
HIN  LACING CORD                   4611T  BBBQ        BBB        0
HIN  FUEL FEED                     46120  BBBR        BBB        0
HIN  FWD INTERCONNECT              4612A  BBBS        BBB        1
HIN  AFT INTERCONNECT              4612B  BBBT        BBB        1
HIN  DEFUELING VALVE               4612D  BBBU        BBB        1
HIN  CHECK VALVE                   4612F  BBBV        BBB        0
HIN  AUX FUEL COUPLING             4612L  BBBW        BBB        1
HIN  SIPHON BREAKER VALVE          4611P  BBBX        BBB        1
HIN AUXILIARY FUEL                        BBC         BBB          000010000
HIN  TANK                          46210  BBCA        BBC        0
HIN  HANGER                        4621A  BBCB        BBC        0
HIN  STRAP                         4621B  BBCC        BBC        0
HIN  HOOK                          4621D  BBCD        BBC        1
HIN  HANGING CORD                  4621E  BBCE        BBC        1
HIN  CELL                          4621F  BBCF        BBC        1
HIN  FILLER CAP AND ADAPTER        4621G  BBCG        BBC        0
HIN  TRANSFER PUMP                 4621H  BBCH        BBC        5
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000000000111111111122222222233333333334444444444555555555566666666677777777778
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HIN  DRAIN VALVE                    4621J   BBCJ            BBC          1
HIN  VENT VALVE                     4621K   BBCK            BBC          1
HIN  CHECK VALVE                    4621L   BBCL            BBC          0
HIN  STUD                           4621C   BBCM            BBC          0
HIN  AUX FUEL CONTROL               4622D   BBCN            BBC          0
HIN  TRANSFER PUMP SWITCH           4622A   BBCP            BBC          5
HIN  TRANSFER RELAY                 4622B   BBCQ            BBC          5
HIN  AUX FUEL LOW SWITCH            4622C   BBCR            BBC          0
HIN  UPPER FLOAT SWITCH             4622D   BBCS            BBC          0
HIN  LOWER FLOAT SWITCH             4622E   BBCT            BBC          1
HIN  AUX FUEL HOLDING RELAY         4622F   BBCU            BBC          0
HIN  CIRCUIT BREAKER                4622G   BBCV            BBC          1
HIN PRESSURIZATION                          BBD             BB                 111111111
HIN NORMAL BOOST                            BBE             BBD      BBF       111111111
HIN NORMAL BOOST                            BBE             BBG                AAAAAAAAA
HIN  BOOST PUMP                     4611E   BBEA            BBE          A
HIN  FUEL BOOST CKT BKR             4614B   BBEB            BBE          1
HIN CROSSFEED BOOST                         BBF             BBD    K BBE       AAAAAAAAA
HIN  BOOST PUMP                     4611E   BBFA            BBF          A
HIN  CROSSFEED SWITCH               4614C   BBFB            BBF          A
HIN  INTERCONNECT VALVE             4612C   BBFC            BBF          A
HIN  FUELCROSSFEED CKT BKR          4614B   BBFD            BBF          1
HIN  FUEL BOOST CKT BKR             4614B   BBFE            BBF          1
HIN BOOST PUMP FAIL WRNG                    BBG             BBF                111111111
HIN  FLOW SWITCH                    4611F   BBGA            BBG          A
HIN  SEGMENT                        4432E   BBGB            BBG          A
HIN  LAMP                           4432F   BBGC            BBG          A
HIN FUEL SUPPLY STATUS                      BBH             BB     I BBB       111111111
HIN FUEL QUANTITY INDICATION                BBJ             BBH      BBK       111111111
HIN  INSTRUMENTS                    46130   BBJA            BBJ          0
HIN  PROBE TANK UNIT 3 EACH         4613A   BBJB            BBJ          8
HIN  COMPENSATOR                    46138   BBJC            BBJ          1
HIN  QUANTITY INDICATOR             4613C   BBJD            BBJ          8
HIN  COUPLER                        46130   BBJE            BBJ          8
HIN  TEST SWITCH                    4613E   BBJF            BBJ          0
HIN  CIRCUIT BREAKER                4613F   BBJG            BBJ          1
HIN LOW LEVEL WARNING                       BBK             BBH    K BBJ       AAAAAAAAA
HIN  FLOAT SWITCH                   4611Q   BBKA            BBK          A
HIN  SEGMENT                        4432E   BBKB            BBK          A
HIN  LAMP                           4432F   BBKC            BBK          A
HIN  CAUTION PANEL                  44320   BCAB            BABG         1
HIN  CAUTION PANEL                  44320   BCAB            BBG          1
HIN 2CAUTION PANEL                  44320   BCAB            BBK          1
HIN  CAUTION PANEL                  44320   BCAB            BDD          1
HIN  CAUTION PANEL                  44320   BCAB            BLG          1
HIN  CAUTION PANEL                  44320   BCAB            BDH          1
HIN  CAUTION PANEL                  44320   BCAB            BED          1
HIN  CAUTION PANEL                  44320   BCAB            BEF          1
HIN  CAUTION PANEL                  44320   BCAB            BFG          1
HIN  CAUTION PANEL                  44320   BCAB            BFD          1
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00000000011111111112222222223333333334444444445555555556666666677777777778
12345678901234567890123456789012345678901234567890123456789012345678901234567890
HIN  CAUTION PANEL          44320   BCAB          BFQ          1
HIN  CAUTION PANEL          44320   BCAB          BFR          1
HIN CAUTION PANEL           44320   BCAB          FCF          1
HIN CAUTION PANEL           44320   BCAB          LFDD         1
HIN CAUTION PANEL           44320   BCAB          RFDD         1
HIN  CAUTION PANEL          44320   BCAB          UAF          1
HIN  CAUTION PANEL          44320   BCAB          UDJ          1
HIN  SWITCH BRIGHT-DIM      44328   BCAC          BABG         1
HIN  SWITCH BRIGHT-DIM      44328   BCAC          BBG          1
HIN  SWITCH BRIGHT-DIM      44328   BCAC          BBK          1
HIN  SWITCH BRIGHT-DIM      44328   BCAC          BDD          1
HIN  SWITCH BRIGHT-DIM      44328   BCAC          BDG          1
HIN  SWITCH BRIGHT-DIM      44328   BCAC          BDH          1
HIN  SWITCH BRIGHT-DIM      44328   BCAC          BED          1
HIN  SWITCH BRIGHT-DIM      44328   BCAC          BEF          1
HIN  SWITCH BRIGHT-DIM      44328   BCAC          BEG          1
HIN  SWITCH BRIGHT-DIM      44328   BCAC          BFD          1
HIN  SWITCH BRIGHT DIM      44328   BCAC          BFQ          1
HIN  SWITCH BRIGHT-DIM      44328   BCAC          BFR          1
HIN TSWITCH BRIGHT DIM      44328   BCAC          FCF          1
HIN  SWITCH BRIGHT DIM      44328   BCAC          LFDD         1
HIN  SWITCH BRIGHT DIM      44328   BCAC          RFDD         1
HIN  SWITCH BRIGHT DIM      44328   BCAC          UAF          1
HIN  SWITCH BRIGHT DIM      44328   BCAC          UDJ          1
HIN  DIMMING RESISTOR       44320   BCAD          BABG         1
HIN  DIMMING RESISTOR       44320   BCAD          BBG          1
HIN  DIMMING RESISTOR       44320   BCAD          BBK          1
HIN  DIMMING RESISTOR       44320   BCAD          BDD          1
HIN  DIMMING RESISTOR       44320   BCAD          BDG          1
HIN  DIMMING RESISTOR       44320   BCAD          BDH          1
HIN  DIMMING RESISTOR       44320   BCAD          BED          1
HIN  DIMMING RESISTOR       44320   BCAD          BEF          1
HIN  DIMMING RESISTOR       44320   BCAD          BEG          1
HIN  DIMMING RESISTOR       44320   BCAD          BFD          1
HIN  DIMMING RESISTOR       44320   BCAD          BFQ          1
HIN  DIMMING RESISTOR       44320   BCAD          BFR          1
HIN  DIMMING RESISTOR       44320   BCAD          FCF          1
HIN  DIMMING RESISTOR       44320   BCAD          LFDD         1
HIN  DIMMING RESISTOR       44320   BCAD          RFDD         1
HIN  DIMMING RESISTOR       44320   BCAD          UAF          1
HIN  DIMMING RESISTOR       44320   BCAD          UDJ          1
HIN  DIMMING DIODE          44320   BCAE          BABG         1
HIN  DIMMING DIODE          44320   BCAE          BBG          1
HIN  DIMMING DIODE          44320   BCAE          BBK          1
HIN  DIMMING DIODE          44320   BCAE          BDD          1
HIN  DIMMING DIODE          44320   BCAE          BDG          1
HIN  DIMMING DIODE          44320   BCAE          BDH          1
HIN  DIMMING DIODE          44320   BCAE          BED          1
HIN  DIMMING DIODE          44320   BCAE          BEF          1
HIN  DIMMING DIODE          44320   BCAE          BEG          1
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0000000001111111111222222223333333344444444455555555566666667777777778
1234567890123456789012345678901234567890123456789012345678901234567890
H1N  DIMMING DIODE                  4432D   BCAE          BFD          1
H1N  DIMMING DIODE                  4432D   BCAE          BFQ          1
H1N  DIMMING DIODE                  4432D   BCAE          BFR          1
H1N  DIMMING DIODE                  4432D   BCAE          FCF          1
H1N  DIMMING DIODE                  4432D   BCAE          LFDD         1
H1N  DIMMING DIODE                  4432D   BCAE          RFDD         1
H1N  DIMMING DIODE                  4432D   BCAE          UAF          1
H1N  DIMMING DIODE                  4432D   BCAE          UDJ          1
H1N  CIRCUIT BREAKER                4432G   BCAF          BA8G         1
H1N  CIRCUIT BREAKER                4432G   BCAF          BBG          1
H1N  CIRCUIT BREAKER                4432G   BCAF          BBK          1
H1N  CIRCUIT BREAKER                4432G   BCAF          BDD          1
H1N  CIRCUIT BREAKER                4432G   BCAF          BDG          1
H1N  CIRCUIT BREAKER                4432G   BCAF          BDH          1
H1N  CIRCUIT BREAKER                4432G   BCAF          BED          1
H1N  CIRCUIT BREAKER                4432G   BCAF          BFF          1
H1N  CIRCUIT BREAKER                4432G   BCAF          BFG          1
H1N  CIRCUIT BREAKER                4432G   BCAF          BFD          1
H1N  CIRCUIT BREAKER                4432G   BCAF          BFQ          1
H1N  CIRCUIT BREAKER                4432G   BCAF          BFR          1
H1N  CKT BKR                        4432G   BCAF          FCF          1
H1N  CKT BKR                        4432G   BCAF          LFDD         1
H1N  CKT BKR                        4432G   BCAF          RFDD         1
H1N  CKT BKR                        4432G   BCAF          UAF          1
H1N  CKT BKR                        4432G   BCAF          UDJ          1
H1N ROTOR RPM STATUS                        BCB           BACE           AAAAAAAAA
H1N ROTOR RPM STATUS                        BCB           BAPE           AAAAAAAAA
H1N  TACH GENERATOR                 2613E   BCBA          BCB          A
H1N  TACH QUILL                     2611C   BCBB          BCB          A
H1N ROTOR RPM INDICATION                    BCC           BCB      BCD   111111111
H1N  TRIPLE  TACH INDICATOR         2613F   BCCA          BCC          8
H1N ROTOR RPM WARNING                       BCD           BCB    K BCC   AAAAAAAA1
H1N  RPM WARNING LIGHT              2613H   BCDA          BCD          1
H1N  RPM WARNING LIGHT              2613H   BCDA          BFL          A
H1N  RPM AUDIO SWITCH               2613L   BCDB          BCD          1
H1N RPM WARNING SYSTEM                      BCE           BCD           AAAAAAAAA
H1N RPM WARNING SYSTEM                      BCE           BFL          FAAAAAAAAA
H1N  RPM WARNING DETECTOR           2613J   BCEA          BCE          A
H1N  RPM WARNING BOX                2613K   BCEB          BCE          A
H1N XMISSION OIL STATUS                     BDA           BABA           AAAAAAAAA
H1N XMISSION OIL PRESSURE                   BDB           BDA    I BABE  AAAAAAAAA
H1N XMISSION OIL PRES IND                   BDC           BDB           111111111
H1N  INDICATOR                      2613A   BDCA          BDC          8
H1N  TRANSMITTER                    2613B   BDCB          BDC          A
H1N  CIRCUIT BREAKER                2613G   BDCC          BDC          1
H1N XMISSION OIL PRES WARNING               BDD           BDB           111111111
H1N  OIL PRESSURE SWITCH            2613Q   BDDA          BDD          A
H1N  SEGMENT                        4432E   BDDB          BDD          A
H1N  LAMP                           4432F   BDDC          BDD          A
H1N TRANSMISSION OIL TEMP                   BDE           BDA    I BABF  AAAAAAAAA
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0000000001111111111222222222233333333344444444445555555556666666667777777778
1234567890123456789012345678901234567890123456789012345678901234567890123456789
HIN XMISSION OIL TEMP IND                BDF          BDE                 1111111111
HIN  INDICATOR                  2613A    BDFA         BDF          8
HIN  OIL TEMP BULB              2613D    BDFB         BDF          A
HIN  CIRCUIT BREAKER            2613G    BDFC         BDF          1
HIN XMISSION OIL TEMP WARN               BDG          BDE                 1111111111
HIN  OIL TEMP SWITCH            2613R    BDGA         BDG          A
HIN  SEGMENT                    4432F    BDGB         BDG          1
HIN  LAMP                       4432F    BDGC         BDG          1
HIN TRANSMISSION CHIP DETECT             BDH          BABA    I BABH      AAAAAAAAA
HIN  CHIP DETECTOR              2613M    BDHA         BDH          A
HIN  CHIP DETECTOR LIGHT        2613N    BDHB         BDH          A
HIN  LAMP                       2613P    BDHC         BDH          A
HIN  SEGMENT                    4432E    BDHD         BDH          1
HIN  LAMP                       4432F    BDHE         BDH          1
HIN COMBINING GEARBOX OIL STATUS         BEA          BACA                AAAAAAAAA
HIN COMBIN GEARBOX PRESSURE              BEB          BEA     I BACC      AAAAAAAAA
HIN COMBIN GEARBOX PRES IND              BEC          BEB                 111111111
HIN  OIL PRESSURE INDICATOR     22BAC    BECA         BEC          A
HIN  OIL PRESSURE XMITTER       22BAJ    BECB         BEC          A
HIN  GBOX OIL PRESS CKT BKR     4241C    BECC         BEC          1
HIN COMBIN GEARBOX PRES WARN             BED          BEB                 111111111
HIN  PRESSURE TRANSDUCER        22AGJ    BEDA         BED          A
HIN  SEGMENT                    4432E    BEDB         BED          A
HIN  LAMP                       4432F    BEDC         BED          A
HIN COMBIN GEARBOX TEMPERATURE           BEE          BEA     I BACD      AAAAAAAAA
HIN  TEMPERATURE INDICATOR      22BAC    BEEA         BEE          8
HIN  OIL TEMP THERMOCOUPLE      22AGK    BEEB         BEE          A
HIN  G BOX OIL TEMP CKT BKR     4241C    BEEC         BEE          1
HIN FILTER BYPASS WARNING                BEF          BEA                 000000000
HIN  BYPASS PRESSURE SWITCH     5922A    BEFA         BEF          A
HIN  SEGMENT                    4432E    BEFB         BEF          A
HIN  LAMP                       4432F    BEFC         BEF          A
HIN COMBIN GEARBOX CHIP DETECT           BEG          BACA    I BACE      AAAAAAAAA
HIN  CHIP DETECTOR              22AGL    BEGA         BEG          A
HIN  CHIP DETECTOR LIGHT        22AGV    BEGB         BEG          A
HIN  LAMP                       22AGW    BEGC         BEG          A
HIN  SEGMENT                    4432E    BEGD         BEG          1
HIN  LAMP                       4432F    BEGE         BEG          1
HIN ENGINE STATUS                        BF           BADA                AAAAAAAAA
HIN OIL STATUS                           BFA          BF                  111111111
HIN OIL PRESSURE                         BFB          BFA     I BAJC      AAAAAAAAA
HIN OIL PRESSURE INDICATION              BFC          BFB                 111111111
HIN  OIL PRESSURE XMITTER       22BAJ    BFCA         BFC          A
HIN  OIL PRESSURE INDICATOR     22BAC    BFCB         BFC          A
HIN  OIL PRESSURE CKT BKR       4241C    BFCC         BFC          1
HIN OIL PRESSURE WARNING                 BFD          BFB                 111111111
HIN  OIL PRESSURE TRANSDUCER    22AGJ    BFDA         BFD          A
HIN  SEGMENT                    4432E    BFDB         BFD          A
HIN  LAMP                       4432F    BFDC         BFD          A
HIN OIL TEMPERATURE                      BFE          BFA     I BAJD      AAAAAAAAA
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H1N  TEMPERATURE INDICATOR          22BAC   BFEA          BFE          8
H1N  OIL TEMP THERMOCOUPLE          22AGK   BFEB          BFE          A
H1N  OIL TEMP CKT BKR               4221G   BFEC          BFE          1
H1N ENGINE TORQUE                           BFF           BF     I BAPG  111111111
H1N  TORQUE XMITTER                 22BAA   BFFA          BFF          A
H1N  DUAL TORQUE INDICATOR          22BAD   BFFB          BFF          8
H1N  TORQUE PRESS CKT BKR           4241C   BFFC          BFF          1
H1N ENGINE SPEED                            BFG           BF     T       AAAAAAAAA
H1N TURBINE RPM                             BFH           BFG           111111111
H1N  TACH GENERATOR                 22BAF   BFHA          BFH          A
H1N  TRIPLE TACH INDICATOR          2613F   BFHB          BFH          1
H1N  TACH GENERATOR GEARSHAFT       22ALB   BFHC          BFH          A
H1N GAS PRODUCER RPM                        BFJ           BFG             AAAAAAAAA
H1N RPM INDICATION                          BFK           BFJ           111111111
H1N  TACH GENERATOR                 22BAF   BFKA          BFK          A
H1N  TACH INDICATOR                 22BAG   BFKB          BFK          1
H1N  TACH GEARSHAFT                 22ALB   BFKC          BFK          A
H1N RPM WARNING                             BFL           BFJ             111111111
H1N INTERTURBINE TEMPERATURE                BFM           BF     T        111111111
H1N  ITT INDICATOR                  22BAH   BFMA          BFM          A
H1N  ITT THERMOCOUPLE               9922B   BFMB          BFM          A
H1N  INCET TEMP CKT BKR             4241C   BFMC          BFM          1
H1N ENGINE FUEL STATUS                      BFN           BF              111111111
H1N FUEL FLOW RATE                          BFP           BFN             000000000
H1N  FUEL FLOW XMITTER              22BAD   BFPA          BFP          A
H1N  FUEL FLOW INDICATOR            22FAE   BFPB          BFP          8
H1N  FUEL FLOW CKT BKR              4241C   BFPC          BFP          1
H1N FUEL FILTER WARNING                     BFQ           BFN             000000000
H1N  BYPASS SWITCH                  4612K   BFQA          BFQ          A
H1N  SEGMENT                        4432E   BFQB          BFQ          A
H1N  LAMP                           4432F   BFQC          BFQ          A
H1N ENGINE CHIP DETECTION                   BFR           BF              111111111
H1N  CHIP DETECTOR                  22AGL   BFRA          BFR          A
H1N  SEGMENT                        4432E   BFRB          BFR          A
H1N  LAMP                           4432F   BFRC          BFR          A
H1N COMM/NAV/IDENT                          C                             AAAAAAAAA
H1N COMMUNICATION                           CA            C      E        001111200
H1N COMM ATTENUATION                        CAA           CA              111111111
H1N SECURE COMMUNICATION                    CAB           CAA             000000000
H1N  COMM SECURE SET-TSEC/KY28      62210   CABA          CAB          8
H1N  INDICATOR C-8157/ARC           6221A   CABB          CAB          9
H1N  MOUNT MT-3802/ARC              6221B   CABC          CAB          0
H1N EXTERNAL COMMUNICATION                  CAC           CAA             111111111
H1N REDUNDANCY ATTENUATION                  CACA          CAC             111111111
H1N UHF COMMUNICATION                       CAD           CACA            111111111
H1N  RADIO SET AN/ARC-116           63111   CADA          CAD          8
H1N  ANTENNA UHF AT-1108/ARC        6231B   CADB          CAD          8
H1N VHF-AM COMMUNICATION                    CAE           CACA            111111111
H1N  VHF COMM SYSTEM AM-C           6231C   CAEA          CAE          0
H1N  RADIO SET AN/ARC-115           6231A   CAEB          CAE          8
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1234567890123456789012345678901234567890123456789012345678901234567890123456789
HIN  ANTENNA VHF AT-1109/ARC    6231B   CAEC        CAE          8
HIN VHF-FM COMMUNICATION                CAF         CACA           111111111
HIN  VHF COMM SYSTEM REMK       6210C   CAFA        CAF          0
HIN  RADIO SET AN/ARC-114       6211A   CAFB        CAF          8
HIN  FILTER                     6211C   CAFC        CAF          1
HIN  ANTENNA AS-1703/ARC        6211D   CAFD        CAF          8
HIN  ANTENNA COUPLER            6211E   CAFE        CAF          8
HIN HF COMMUNICATION                    CAG         CACA           111111111
HIN  REC/XMITTER RT-698/ARC102  61111   CAGA        CAG          8
HIN  MOUNT MT-3772A/A           61112   CAGB        CAG          0
HIN  INVERTER PP-3762/ARC102    61113   CAGC        CAG          A
HIN  CONTROL C-3940/ARC94       61114   CAGD        CAG          8
HIN  ANTENNA                    61115   CAGE        CAG          8
HIN  ANTENNA COUPLER CU-1658/A  61116   CAGF        CAG          9
HIN INTERNAL COMMUNICATION              CAH         CAA            000000000
HIN INTERNAL COMMUNICATION              CAH         CCM            F111111111
HIN AIRCREW COMMUNICATION               CAJ         CAC            111111111
HIN AIRCREW COMMUNICATION               CAJ         CAH            111111111
HIN PILOT COMM CONTROL                  CAK         CAJ            111111111
HIN PILOT COMM CONTROL                  CAK         CAJ    H       AAAAAAAAA
HIN  CONTROL PANEL C-6533/ARC   6411A   CAKA        CAK          8
HIN  CORD AE-14/U               6411B   CAKB        CAK          8
HIN  PLUG U-92A/U               6411C   CAKC        CAK          8
HIN  CORD AN-85/U               6411D   CAKD        CAK          8
HIN  PLUG U-94A/U               6411E   CAKE        CAK          8
HIN  HEADSET                    6411F   CAKF        CAK          1
HIN  FOOT SWITCH                6411G   CAKG        CAK          1
HIN  HOT MIKE SWITCH            6411H   CAKH        CAK          0
HIN  MIKE SWITCH (CYCLIC)       6411J   CAKJ        CAK          1
HIN FLIGHT CREW COMM                    CAL         CAC            111111111
HIN FLIGHT CREW COMM                    CAL         CAH            000000000
HIN  CONTROL PANEL 2 EACH       6411A   CALA        CAL          1
HIN  CORD AE-14/U  2 EACH       6411B   CALB        CAL          1
HIN  PLUG U-92A/U  2 EACH       6411C   CALC        CAL          1
HIN  CORD AN-85/U  2 EACH       6411D   CALD        CAL          1
HIN  PLUG U-94A/U  2 EACH       6411E   CALE        CAL          1
HIN  HEADSET 4 EACH             6411F   CALF        CAL          1
HIN  FOOT SWITCH 2 EACH         6411G   CALG        CAL          1
HIN  HOT MIKE SWITCH 2 EACH     6411H   CALH        CAL          0
HIN IDENTIFICATION                      CB          C              000000000
HIN  IFF XPONDER AN/APX-72      6511C   CBA         CB           0
HIN  RECEIVER XMITTER RT-659    6511A   CBB         CB           8
HIN  MOUNTING MT-3809/APX-72    6511B   CBC         CB           0
HIN  CONTROL UNIT C-6280P/APX   6511C   CBD         CB           8
HIN  ANTENNA AT-741/A           6511D   CBE         CB           8
HIN  ALTIMETER ENCODER          6511E   CBF         CB           1
HIN  CIRCUIT BREAKER            6511F   CBG         CB           1
HIN  IFF TEST EQUIPMENT         6521C   CBH         CB           0
HIN  XPONDER TEST SET TS-1343   6521A   CBJ         CB           0
HIN  MOUNTING MT-3513/APX       6521B   CBK         CB           0
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H1N  MARK XII COMPUTER KIT 147 65210    CBL          CH           0
H1N NAVIGATION                          CC           C      E     CC0122200
H1N DEAD RECKONING                      CCA          CC     K CCD AAAAAAAAA
H1N HEADING                             CCB          CCA         AAAAAAAAA
H1N  STANDBY COMPASS            51220   CCBA         CCB         0
H1N  COMPASS                    5122A   CCBB         CCB         A
H1N  CORRECTION CARD HOLDER     51223   CCBC         CCB         C
H1N TIME                                CCC          CCA         AAAAAAAAA
H1N  CLOCK                      51318   CCCA         CCC         0
H1N NAV AIDS                            CCD          CC          000555000
H1N NAV DISPLAYS                        CCE          CCD         AAAAAAAAA
H1N RANGE                               CCF          CCE         111111111
H1N  INDICATOR BDHI 2 EACH      7111E   CCFA         CCF         1
H1N BEARING                             CCG          CCE         888888888
H1N  INDICATOR BDHI 2 EACH      7111C   CCGA         CCG         1
H1N COURSE                              CCH          CCE         555555555
H1N  COURSE INDICATOR 2 EACH    62118   CCHA         CCH         1
H1N MARKER BEACON LITE                  CCJ          CCE         000000100
H1N  INDICATOR 2 EACH           7151E   CCJA         CCJ         1
H1N HEADING                             CCK          CCE         888888888
H1N BDHI                                CCKA         CCK         111111111
H1N  INDICATOR BDHI 2 EACH      7111E   CCKAA        CCKA        1
H1N COURSE INDICATOR                    CCKB         CCK         111111111
H1N  COURSE INDICATOR 2 EACH    62118   CCKBA        CCKB        1
H1N NAV ELECTRONICS                     CCL          CCD         AAAAAAAAA
H1N MARKER BEACON                       CCM          CCP         000000100
H1N  MARKER BEACON R-1041/ARN   7151D   CCMA         CCM         0
H1N  RECEIVER R-1041/ARN        7151A   CCMB         CCM         8
H1N  ANTENNA AT-640/ARN         7151B   CCMC         CCM         8
H1N  CONTROL SWITCH             7151C   CCMD         CCM         A
H1N  SENSING SWITCH             7151D   CCME         CCM         A
H1N GYRO COMPASS                        CCN          CCL         888888888
H1N  GYROMAG COMPASS AN/ASN43   51210   CCNA         CCN         0
H1N  DIRECTIONAL GYRO CN-398    5121A   CCNB         CCN         A
H1N  XMITTER T511/ASN           5121B   CCNC         CCN         A
H1N  COMPENSATOR CN-435/ASN     5121C   CCND         CCN         8
H1N  COMPASS MAG-DG SWITCH      5121D   CCNE         CCN         5
H1N  COMPASS CONTROLLER C6347   5121E   CCNF         CCN         8
H1N  ELECT CONT AMP AM-6015A    5121F   CCNG         CCN         8
H1N VOR/TAC                             CCP          CCL         111111111
H1N VOR                                 CCPA         CCP         111111111
H1N  VOR AN/ARN-82              71310   CCPAA        CCPA        0
H1N  RECEIVER RADIO R-1388      7131A   CCPAB        CCPA        8
H1N  CONTROL UNIT C-6873        7131B   CCPAC        CCPA        8
H1N  ANTENNA AS-1304 OMN4-4<    7131C   CCPAD        CCPA        8
H1N  ANTENNA OMN4-4  AS-1304<   7131D   CCPAE        CCPA        8
H1N  MOUNTING MT-3600           7131F   CCPAF        CCPA        0
H1N  ANTENNA FV HOMING          6211F   CCPAG        CCPA        8
H1N TACAN                               CCPB         CCP         111111111
H1N  TACAN AN/ARN-65            71210   CCPBA        CCPB        0
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HIN  CONTROL C-1783/ARN-21A      7121A  CCPBB    CCPB     8
HIN  REC/XMITTER RT-471/ARN-65   7121B  CCPBC    CCPB     8
HIN  MOUNTING MT-2691/ARN-65     7121C  CCPBD    CCPB     0
HIN  ANTENNA AT-741/A            7121D  CCPBE    CCPB     8
HIN  CHANNEL SELECTOR SERVO      7121E  CCPBF    CCPB     8
HIN  VIDEO DECODER               7121G  CCPBG    CCPB     8
HIN  AZ GATE                     7121H  CCPBH    CCPB     8
HIN  AZ CONTROL                  7121J  CCPBJ    CCPB     8
HIN  RANGE GATE                  7121K  CCPBK    CCPB     1
HIN  RANGE CONTROL               7121L  CCPBL    CCPB     1
HIN  IF AMPLIFIER                7121M  CCPBM    CCPB     8
HIN  PHASE DETECTOR              7121N  CCPBN    CCPB     8
HIN  AZ COUPLER                  7121P  CCPBP    CCPB     8
HIN  RANGE COUPLER               7121Q  CCPBQ    CCPB     1
HIN DIRECTION FINDING            CCR    CCL                11111000
HIN ADF                          CCRA   CCR                111111111
HIN  ADF AIN/ARN-89              7141Q  CCRAA    CCRA     0
HIN  RECEIVER RADIO R-1495       7141A  CCRAB    CCRA     8
HIN  CONTROL UNIT C-7392         7141B  CCRAC    CCRA     8
HIN  AMPLIFIER AM-4859/ARN-89    7141C  CCRAD    CCRA     8
HIN  ANTENNA LOOP AS-2103        7141D  CCRAE    CCRA     8
HIN  ANTENNA SENSE               7141E  CCRAF    CCRA     8
HIN UHF-DF                       CCRB   CCR                111111111
HIN  UHF DF AN/ARA 50            7111Q  CCRBA    CCRB     0
HIN  ANTENNA AS-909/ARA48        7111A  CCRBB    CCRB     8
HIN  AMP AM-3624/ARA 50          7111B  CCRBC    CCRB     8
HIN  PRE-AMP AM-3969/AR          7111C  CCRBD    CCRB     8
HIN  MOUNT MT-1955/ARA 50        7111D  CCRBE    CCRB     0
HIN  RADIO SET AN/ARC-116        63111  CCRBF    CCRB     8
HIN INFORMATION AND DISPLAYS     D      DAA                AAAAAAAAA
HIN WARNING INFORMATION          DAA    D                  AAAAAAAAA
HIN MASTER CAUTION               DAB    DAA                000000000
HIN  MASTER CAUTION LIGHT        4431C  DABA     DAB      0
HIN  LIGHT ASSEMBLY              4431A  DABB     DAB      8
HIN  RESET SWITCH                4431B  DABC     DAB      1
HIN  DIMMING RESISTER            4431C  DABD     DAB      1
HIN  DIMMING DIODE               4431D  DABE     DAB      1
HIN  LAMP                        4431E  DABF     DAB      A
HIN PAX WRNG HORN                DAC    DAA                000000000
HIN  PAX ALARM HORN              91210  DACA     DAC      0
HIN  HORN                        9121A  DACB     DAC      8
HIN  SWITCH                      9121B  DACC     DAC      5
HIN  SWITCH GUARD                9121C  DACD     DAC      0
HIN  CIRCUIT BREAKER             9121D  DACE     DAC      1
HIN ENGINE FIRE EXTINGUISH       DAD    DAA   X            AAAAAAAAA
HIN  ENG FIRE EXTINGUISHER       9111C  DADA     DAD      0
HIN  SELECTOR SWITCH             9111A  DADB     DAD      5
HIN  EMERGENCY SWITCH            9111C  DADC     DAD      A
HIN  PULL HANDLE                 9111D  DADD     DAD      A
HIN  RELAY                       9111E  DADE     DAD      A
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000000000111111111122222222233333333334444444445555555556666666667777777779
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HIN  TUBE                          9111G    DADF          DAD          8
HIN  MANIFOLD                      9111J    DADG          DAD          1
HIN ENGINE FIRE WARNING                     DAL           DAD          111111111
HIN  LIGHT ASSY                    4911A    DAEA          DAE          A
HIN  LAMP                          4911G    DAEB          DAE          A
HIN RESERVE FIRE EXTINGUISH                 DAF           DAD    K DAH AAAAAAAAA
HIN  CIRCUIT BREAKER               9111B    DAFA          DAF          1
HIN  FIRE EXT CONTAINER            9111F    DAFB          DAF          1
HIN  MOUNT                         9111H    DAFC          DAF          0
HIN  INDICATOR DISC                9111K    DAFD          DAF          0
HIN  FIRE EXT SQUIB                9711A    DAFE          DAF          A
HIN ENGINE FIRE DETECTION                   DAG           DAE          AAAAAAAAA
HIN ENGINE FIRE DETECTION                   DAG           DAF          AAAAAAAAA
HIN  ENG FIRE DETECT SYSTEM        4911D    DAGA          DAG          0
HIN  AMPLIFIER                     4911B    DAGB          DAG          8
HIN  TEST SWITCH                   4911C    DAGC          DAG          0
HIN  RESISTOR                      4911D    DAGD          DAG          A
HIN  ELEMENT                       4911E    DAGE          DAG          A
HIN  CIRCUIT BREAKER               4911F    DAGF          DAG          1
HIN MAIN FIRE EXTINGUISH                    DAH           DAD      DAF 111111111
HIN CIRCUIT BREAKER                9111D    DAHA          DAH          1
HIN FIRE EXT CONTAINER             9111F    DAHB          DAH          1
HIN MOUNT                          9111H    DAHC          DAH    •     0
HIN INDICATOR DISC                 9111K    DAHD          DAH          C
HIN FIRE EXT SQUIB                 9711A    DAHE          DAH          A
HIN FLIGHT STATUS                           DBA           D                 001121200
HIN OUTSIDE AIR TEMP                        DBB           DBA               000000000
HIN  FREE AIR TEMP IND             5131A    DBBA          DBB          8
HIN ATTITUDE                                DBC           DBA    E          001151100
HIN PITCH/ROLL                              DBCA          DBC               AAAAAAAAA
HIN PILOTS IND                              DBCB          DBCA              111111111
HIN PILOTS IND                              DBCB          DBCA   H          AAAAAAAAA
HIN  ATTITUDE INDICATOR            5111F    DBCBA         DBCB         8
HIN  RATE SWITCHING GYRO           5111F    DBCBB         DBCB         A
HIN ROLL/PITCH DISPLACE GYRO       5111G    DBCBC         DBCB         A
HIN  PHASE ADAPTER                 5111J    DBCBD         DBCB         A
HIN  CIRCUIT BREAKER               4241C    DBCBE         DBCB         1
HIN TURN/SLIP                               DBCD          DBC    K DBCA     AAAAAAAAA
HIN PILOTS IND                              DBCE          DBCD              111111111
HIN PILOTS IND                              DBCE          DBCD   H          AAAAAAAAA
HIN TURN AND SLIP IND              5111D    DBCEA         DBCE         5
HIN AIRSPEED                                DBD           DBX               001000300
HIN AIRSPEED                                DBD           DBX    B          000080000
HIN PILOTS IND                              DBDA          DBD               111111111
HIN PILOTS IND                              DBDA          DBD    H          AAAAAAAAA
HIN  AIRSPEED INDICATOR            5111A    DBDAA         DBDA         8
HIN PITOT SENSE AND DIST                    DBDB          DBD               AAAAAAAAA
HIN  PITOT STATIC SYST             5112D    DBDBA         DBDB         0
HIN  PITOT TUBE                    5112A    DBDBB         DBDB         A
HIN  PITOT HEATER                  5112C    DBDBC         DBDB         1
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H1N  HEATER SWITCH                  5112D   DBDHD          DBDH          1
H1N  CIRCUIT BREAKER                5112E   DBDBE          DBDH          1
H1N  MANIFOLD                       5112F   DBDHF          DBDH          1
H1N  DRAIN                          5112G   DBDBG          DBDB          1
H1N ALTITUDE                                DBE            DBA     E           000AAAAAA
H1N BAROMETRIC IND                          DBEA           DBE       DBEC      111111111
H1N PILOTS IND                              DBEB           DBEA                111111111
H1N PILOTS IND                              DBEB           DBEA    H           AAAAAAAAA
H1N  ALTIMETER IND                  51113   DBEBA          DBEB            A
H1N RADAR ALT IND                           DBEC           DBE     K DBEA      AAAAAAAAA
H1N  RADAR ALT AN/APN-171           7211C   DBECA          DBEC            0
H1N  REC-XMIT RT-804/APN-171        7211A   DBECB          DBEC            8
H1N  ANTENNA AS-1858/APN-171        7211B   DBECC          DBEC            8
H1N  MOUNTING BASE                  7211D   DBECE          DBEC            1
H1N  CRYSTAL TURRET                 7212F   DBECF          DBEC            8
H1N PILOTS IND                              DBED           DBEC                111111111
H1N PILOTS IND                              DBED           DBEC    H           AAAAAAAAA
H1N  INDICATOR HEIGHT 10-1345       7211C   DBEDD          DBED            A
H1N VERT VEL IND                            DBEF           DBC     K DBCA      AAAAAAAAA
H1N PILOTS IND                              DBEG           DBEF                111111111
H1N PILOTS IND                              DBEG           DBEF    H           AAAAAAAAA
H1N  RATE OF CLIMB IND              5111C   DBEGA          DBEG            A
H1N STATIC SENSE                            DBEH           DBD                 AAAAAAAAA
H1N STATIC SENSE                            DBEH           DBEA                AAAAAAAAA
H1N STATIC SENSE                            DBEH           DBEF               FAAAAAAAAA
H1N  STATIC PORT                    5112B   DBEHA          DBEH            1
H1N AIRSPEED ATTEN                          DBX            DBA                 111111111
H1N ENVIRONMENTAL CONTROL                   E                                  AAAAAAAAA
H1N LIGHTING                                EA             E       D           011111210
H1N INTERNAL LIGHTING                       EAA            EA                  111111111
H1N NORMAL LIGHTING                         EAB            EAA       EAJ       111111111
H1N INSTRUMENT LIGHTING NORMAL              EAC            EAB       EAM       111111111
H1N PILOTS INSTRUMENTS                      EAD            EAC                 111111111
H1N COPILOTS INSTRUMENTS                    EAD            EAC     H           AAAAAAAAA
H1N  INST PANEL LIGHTS              44120   EADA           EAD             0
H1N  POWER SUPPLY                   4412A   EADB           EAD             8
H1N  CONTROL                        4412B   EADC           EAD             8
H1N  CIRCUIT BREAKER                4412C   EADD           EAD             8
H1N  LIGHT ASSY                     4412D   EADE           EAD             1
H1N  LAMP                           4412E   EADF           EAD             1
H1N ENGINE INSTRUMENT                       EAF            EAC                 888888888
H1N  INST PANEL LIGHTS              44120   EAFA           EAF             0
H1N  POWER SUPPLY                   4412A   EAFB           EAF             8
H1N  CONTROL                        4412B   EAFC           EAF             8
H1N  CIRCUIT BREAKER                4412C   EAFD           EAF             8
H1N  LIGHT ASSY                     4412D   EAFE           EAF             1
H1N  LAMP                           4412E   EAFF           EAF             1
H1N OVERHEAD CONSOLE                        EAG            EAB                 111111111
H1N  OVERHEAD CONSOLE LIGHTS        44150   EAGA           EAG             0
H1N  CONTROL                        4415A   EAGB           EAG             8
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HIN  TRANSISTOR                    4415B   EAGC          EAG          8
HIN  CIRCUIT BREAKER               4415C   EAGD          EAG          8
HIN  LIGHT ASSY                    4415D   EAGE          EAG          1
HIN  LAMP                          4415E   EAGF          EAG          1
HIN PEDESTAL LIGHTING                      EAH           EAB            111111111
HIN  PEDESTAL LIGHTS               44140   EAHA          EAH          0
HIN  CONTROL                       4414A   EAHB          EAH          8
HIN  TRANSISTOR                    4414B   EAHC          EAH          8
HIN  CIRCUIT BREAKER               4414C   EAHD          EAH          8
HIN  LIGHT ASSY                    4414D   EAHE          EAH          1
HIN  LAMP                          4414E   EAHF          EAH          1
HIN BACKUP LIGHTING                        EAJ           EAA    K EAB   AAAAAAAAA
HIN DOME LIGHTS                            EAK           EAJ            111111111
HIN  DOME LIGHTS                   41110   EAKA          EAK          0
HIN  RHEOSTAT                      4111A   EAKB          EAK          8
HIN  SELECTOR SWITCH               4111B   EAKC          EAK          4
HIN  CKT BKR                       4111C   EAKD          EAK          8
HIN  LIGHT ASSY                    4111D   EAKE          EAK          2
HIN  LAMP                          4111E   EAKF          EAK          2
HIN UTILITY LIGHTS                         EAL           EAJ            111111111
HIN  UTILITY LIGHTS                44160   EALA          EAL          0
HIN  LIGHT ASSY                    4416A   EALB          EAL          5
HIN  LAMP                          4416B   EALC          EAL          5
HIN  CKT BKR                       4416C   EALD          EAL          8
HIN INSTRUMENT SECONDARY                   EAM           EAB    K EAC   AAAAAAAAA
HIN  INST SECONDARY LIGHTS         44130   EAMA          EAM          0
HIN  CONTROL                       4413A   EAMB          EAM          A
HIN  TRANSISTOR                    4413B   EAMC          EAM          8
HIN  CKT BKR                       4413C   EAMD          EAM          8
HIN  LAMP                          4413E   EAME          EAM          1
HIN INSPECTION LIGHTING                    EAN           EAB            000000000
HIN  SPARE LAMPS                   44411   EANA          EAN          0
HIN  TRANS OIL LEVEL INSP LIGHT    4442C   EANB          EAN          0
HIN  LIGHT                         44421   EANC          EAN          8
HIN  LAMP                          44422   EAND          EAN          A
HIN  SWITCH                        44423   EANE          EAN          A
HIN  CKTBKR                        44424   EANF          EAN          8
HIN EXTERNAL LIGHTING                      EAP           EA             111111111
HIN EXT LIGHT ATTENUATION                  EAQ           EAP            111111111
HIN NAVIGATION LIGHTS                      EAR           EAQ            000000000
HIN  NAV LIGHTS                    44210   EARA          EAR          0
HIN  SWITCH STDY-OFF-ON            4421A   EARB          EAR          5
HIN  SWITCH BRIGHT DIM             4421B   EARC          EAR          5
HIN  LIGHT ASSY       6 EA         4421C   EARD          EAR          1
HIN  LAMP             6 EA         4421D   EARE          EAR          1
HIN  FLASHER                       4421E   EARF          EAR          5
HIN  CIRCUIT BREAKER               4421F   EARG          EAR          8
HIN ANTI-COLLISION LIGHT                   EAS           EAQ            000000000
HIN  ANTI-COLLISION LIGHT          44220   EASA          EAS          0
HIN  LIGHT ASSY                    4422A   EASB          EAS          8
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HIN  LAMP                2 EA     4422B   EASC          EAS          1
HIN  MOTOR                        4422C   EASD          EAS          5
HIN  SWITCH                       4422D   EASE          EAS          A
HIN  CIRCUIT BREAKER              4422E   EASF          EAS          8
HIN FORMATION LIGHTS              4424    EAT           EAQ             000000000
HIN  FORMATION LIGHTS             4424C   EATA          EAT          0
HIN  FORM LIGHT CKTBKR            4424B   EATB          EAT          8
HIN  ROTOR TIP CONTROL            4424A   EATC          EAT          8
HIN  ROTOR TIP CKT BKR            4424B   EATD          EAT          8
HIN  ROTOR TIP SLIP RING          4424D   EATE          EAT          5
HIN  ROTOR TIP BRUSHES            4424E   EATF          EAT          5
HIN  ROTOR TIP LAMPS     2 EA     4424G   EATG          EAT          1
HIN  FUSELAGE CONTROL             4424A   EATH          EAT          8
HIN  FUSELAGE CKT BKR             4424B   EATJ          EAT          8
HIN  FUSELAGE LIGHT      4 EA     4424C   EATK          EAT          1
HIN  FUSELAGE LAMPS      4 EA     4424G   EATL          EAT          1
HIN LANDING LIGHTS                        EAU           EAQ     EAV     000000100
HIN  LANDING LIGHT                4423D   EAUA          EAU          0
HIN  SWITCH ON-OFF                4423A   EAUB          EAU          A
HIN  SWITCH EXT-RET               4423B   EAUC          EAU          5
HIN  LIGHT ASSY                   4423C   EAUD          EAU          8
HIN  LIMIT SWITCH                 4423D   EAUE          EAU          1
HIN  LAMP                         4423E   EAUF          EAU          A
HIN  MOTOR                        4423F   EAUG          EAU          8
HIN  CKT BKRS            2 EA     4423G   EAUH          EAU          8
HIN SEARCH LIGHT                          EAV           EAQ   K EAU     000000A00
HIN  SEARCHLIGHT                  4425Q   EAVA          EAV          0
HIN  SWITCH EXT-RET-LEFT-RIGHT    4425A   EAVB          EAV          8
HIN  SWITCH ON-OFF-STOW           4425B   EAVC          EAV          8
HIN  LIMIT SWITCH                 4425C   EAVD          EAV          1
HIN  CKT BKRS            2 EA     4425D   EAVE          EAV          8
HIN  SEARCHLIGHT ASSY             4425F   EAVF          EAV          8
HIN  MOTOR %ROTATION%             4425F   EAVG          EAV          A
HIN  MOTOR EXT-RET                4425G   EAVH          EAV          A
HIN  LAMP                         4425H   EAVJ          EAV          A
HIN CABIN ENVIRONMENT                     EB            E               000000000
HIN CABIN VENTILATION                     EBA           EB              111111111
HIN  PEDESTAL VENT OUTLET         4111H   EBAA          EBA          0
HIN  VENT AIR OUTLETS             4111L   EBAB          EBA          0
HIN  DRAIN HOSE                   4111M   EBAD          EBA          0
HIN  CLAMPS                       4111P   EBAE          EBA          1
HIN VALVE VENT AIR CHECK  2 EA    4112D   EBAF          EBA          0
HIN  VENT AIR INTAKES     2 EA    4112G   EBAG          EBA          0
HIN  VENT PUSH-PULL CABLE 2 EA    4113N   EBAH          EBA          5
HIN CABIN HEAT                            EBB           EB              555555555
HIN  DUCT SEL VAL-DOOR POST       4111E   EBBA          EBB          1
HIN  DOOR POST OUTLETS            4111F   EBBB          EBB          0
HIN  DUCT SEL VAL-PEDESTAL        4111G   EBBC          EBB          1
HIN  PEDESTAL OUTLET              4111H   EBBD          EBB          0
HIN  VALVE DOOR POST OUTLET       4112C   EBBE          EBB          3
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1234567890123456789012345678901234567890123456789012345678901234567890123456789
HIN BLOWER ASSIST                                EBC              EBA          111111111
HIN BLOWER ASSIST                                EBC              ECA          111111111
HIN  BLOWERS          2 EA       4111K           EBCA             EBC        5
HIN  CKT BKR                     4113A           EBCB             EBC        8
HIN  BLOWER SWITCH               4113C           EBCC             EBC        A
HIN WARM AIR DISTRIBUTION                        EBE              EBA          AAAAAAAAA
HIN WARM AIR DISTRIBUTION                        EBE              ECA          AAAAAAAAA
HIN  NOISE SUPPRESSOR            4111B           EBEA             EBE        1
HIN  PLENUM                      4111C           EBEB             EBE        1
HIN  DUCT PLENUM-SEL VALVE       4111D           EBEC             EBE        1
HIN  COUPLING                    4111N           EBED             EBE        1
HIN  CLAMP                       4111P           EBEE             EBE        1
HIN  HEAT AND DEFROST SELECTOR   4112E           EBEF             EBE        2
HIN  AFT OUTLET SWITCH           4113F           EBEG             EBE        2
HIN  AFT OUTLET LIMIT SWITCH     4113G           EBEH             EBE        2
HIN MIXING/TEMP CONTROL                          EBF              EBC          AAAAAAAAA
HIN  VALVE VAR CONTROL MIXING    4112B           EBFA             EBF        8
HIN  OVERHEAT SWITCH             4113D           EBFB             EBF        8
HIN  OVERHEAT RELAY              4113E           EBFC             EBF        5
HIN  TEMPERATURE SELECTOR        4113H           EBFD             EBF        5
HIN  REMOTE SENSOR               4113J           EBFE             EBF        5
HIN  SENSING TUBE                4113K           EBFF             EBF        1
HIN BLEED AIR SUPPLIED                           EBG              EBF          AAAAAAAAA
HIN  TUBE-ENG TO MIX VALVE 2 EA4111A             EBGA             EBG        1
HIN  VALVE BLEED AIR SHUTOFF 2   4112A           EBGB             EBG        1
HIN  CKT BKR HEAT                4113A           EBGC             EBG        8
HIN  HEATER SWITCH               4113B           EBGD             EBG        A
HIN WINDSHIELD CLEAR                             EC               E            111111111
HIN WINDSHIELD DEFROST                           ECA              EC       Y   011010110
HIN  DEFROST NOZZLES   2 EA      4111J           ECAA             ECA        0
HIN  DEFOG HEAT/VENT VYE         4112F           ECAB             ECA        0
HIN  LEVER                       4113L           ECAC             ECA        1
HIN  ARM                         4113M           ECAD             ECA        1
HIN RAIN REMOVAL                                 ECB              EC       G   000010110
HIN PILOTS RAIN REMOVAL                          ECC              ECB          111111111
HIN PILOTS RAIN REMOVAL                          ECC              ECB      H   AAAAAAAAA
HIN  WIPER ASSY                  12EAA           ECCA             ECC        1
HIN  ARM                         12EAB           ECCB             ECC        8
HIN  STOP                        12EAC           ECCC             ECC        0
HIN  HEADGUARD                   12EAD           ECCD             ECC        0
HIN  CKT BKR                     12EBA           ECCE             ECC        8
HIN  SELECTOR SWITCH             12EB6           ECCF             ECC        5
HIN  WIPER SWITCH                12EBC           ECCG             ECC        8
HIN  RESISTOR PANEL              12EBD           ECCH             ECC        2
HIN  MOTOR/CONVERTER             12EBE           ECCJ             ECC        A
HIN FLIGHT CONTROLS                              F                            AAAAAAAAA
HIN MAIN ROTOR POSITIONED                        FAA              F            0AAAAAAAA0
HIN  HUB                         151B0           FAAA             FAA        8
HIN  GRIP                2 EA    151BA           FAAB             FAA        A
HIN  DRAG BRACE          2 EA    151BB           FAAC             FAA        8
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1234567890123456789012345678901234567890123456789012345678901234567890123456789
H1N  STATIC STOP              2 EA 151BD   FAAD                FAA          0
H1N  BLADE BOLT %MAIN<        2 EA 151BE   FAAE                FAA          A
H1N  BLADE BOLT %DRAG LINK<4 EA151BE   FAAF                FAA          8
H1N  GRIP RESERVOIR           2 EA 151BF   FAAG                FAA          1
H1N  TRUNNION                      151BG   FAAH                FAA          3
H1N  PILLOW BLOCK RESERVOIR2 EA151BH   FAAJ                FAA          1
H1N  PILLOW BLOCK             2 EA 151BJ   FAAK                FAA          3
H1N  MAST NUT                      151BK   FAAL                FAA          A
H1N  STRAP                    2 EA 151BL   FAAM                FAA          A
H1N  RADIUS RING %YOKE<       2 EA 151BM   FAAN                FAA          A
H1N  PIN STRAP                4 EA 151BN   FAAP                FAA          A
H1N  BLADE ASSY               2 EA 151CC   FAAQ                FAA          8
H1N  TRIM TAB                 2 EA 151CA   FAAR                FAA          0
H1N  TRAILING EDGE STRIP      2 EA 151CB   FAAS                FAA          0
H1N  TIP CAP                  2 EA 151CC   FAAT                FAA          0
H1N  LEADING EDGE             2 EA 151CD   FAAU                FAA          0
H1N  SKIN                     2 EA 151CE   FAAV                FAA          0
H1N  CORE                     2 EA 151CF   FAAW                FAA          0
H1N MAIN ROTOR CONTROLS                    FAB                 FAA            AAAAAAAAA
H1N  STABILIZER BAR                151AC   FABA                FAB          1
H1N  CENTER FRAME                  151AA   FABB                FAB          1
H1N  MIXING LEVER        2 EA      151AB   FABC                FAB          8
H1N  SUPPORT                       151AC   FABD                FAB          1
H1N  WIRE ROPE                     151AD   FABE                FAB          1
H1N  DAMPERS             2 EA      151AE   FABF                FAB          1
H1N  TUBE                  2 EA    151AF   FABG                FAB          0
H1N  CNTRFRAME/MIXLEVER BEARING151AG   FABH                FAB          1
H1N  CNTR FRAME/SUPPORT BEARING151AH   FABJ                FAB          1
H1N  MIX LEVER/CONT TUBE BEARIN151AJ   FABK                FAB          1
H1N  DAMPER SUPPORT                151AK   FABL                FAB          1
H1N  PITCH HORNS         2 EA      151BC   FABM                FAB          8
H1N  SCISSORS AND SLEEVE ASSY      151DD   FABMA               FAB          8
H1N  SLEEVE                        151DA   FABN                FAB          1
H1N  SLEEVE BEARING SET            151DB   FABP                FAB          2
H1N  HUB                           151DC   FABQ                FAB          2
H1N  SCISSORS                      151DD   FABR                FAB          1
H1N  PIVOT BEARING SET             151DF   FABS                FAB          1
H1N  BEARING LINER                 151DG   FABT                FAB          1
H1N  DRIVE PLATE                   151DJ   FABU                FAB          8
H1N  SCISSORS/MIX TUB BEARING      151DK   FABV                FAB          1
H1N  BOLTS                         151DL   FABW                FAB          8
H1N  SWASHPLATE AND SUPPORT ASS151ED   FABX                FAB          8
H1N  SUPPORT                       151EA   FABY                FAB          1
H1N  SUPPORT BUSHING               151EB   FABZ                FAB          1
H1N  GIMBAL RING                   151EC   FABZA               FAB          2
H1N  GIMBAL RING BEARING           151ED   FABZB               FAB          2
H1N  INNER RING                    151EE   FABZC               FAB          1
H1N  OUTER RING                    151EF   FABZD               FAB          1
H1N  SWASH PLATE BEARING           151EG   FABZE               FAB          1
H1N  OUTER COVER                   151EJ   FABZF               FAB          0
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H1N	INNER COVER		151EK	FABZG	FAB		C	
H1N	BOLTS		151EL	FABZH	FAB		8	
H1N	CONTROL LINKAGE		151HG	FABZJ	FAB		0	
H1N	TUBE SCISSORS TO STAB BAR		151HA	FABZK	FAB		8	
H1N	CONNECTING LINK DAMPER		151HB	FABZL	FAB		1	
H1N	PITCH LINK		151HC	FABZM	FAB		8	
H1N	UNIVERSAL "UNKNOWNK		151HD	FABZN	FAB		0	
H1N	BOLTS		151HE	FABZP	FAB		8	
H1N	COLLECTIVE DRIVE			FAC	FAB			AAAAAAAAA
H1N	COLLECTIVE LEVER ASSY		151FC	FACA	FAC		8	
H1N	SUPPORT BEARING		151FA	FACB	FAC		2	
H1N	SPACER		151FB	FACC	FAC		0	
H1N	SLEEVE BEARING		151FC	FACD	FAC		2	
H1N	TRUNNION		151FD	FACE	FAC		1	
H1N	PIN		151FE	FACF	FAC		1	
H1N	BOLTS		151FF	FACG	FAC		8	
H1N	CONTROL TUBES		1411J	FACH	FAC		8	
H1N	BELL CRANK		1411K	FACJ	FAC		8	
H1N	BOOST CYLINDER		1411L	FACK	FAC		7	
H1N	CYLINDER SUPPORT		1411M	FACL	FAC		C	
H1N	SPRING		1411N	FACM	FAC		0	
H1N	UNIVERSAL		1411P	FACN	FAC		8	
H1N	CYLINDER BOOT		1411Q	FACP	FAC		0	
H1N	LOWER CLEVIS		1411R	FACQ	FAC		8	
H1N	BOLT		1411S	FACR	FAC		8	
H1N	PILOTS COLLECTIVE CONTROLS			FAD	FAC			111111111
H1N	ILOTS COLLECTIVE CONTROLS			FAD	FAC	H		AAAAAAAAA
H1N	STICK		1411A	FADA	FAD		8	
H1N	FRICTION NUT		1411B	FADB	FAD		@	
H1N	DRAG LINKAGE		1411C	FADC	FAD		0	
H1N	FRICTION SHOE		1411D	FADD	FAD		0	
H1N	HOUSING		1411E	FADE	FAD		1	
H1N	BOOT		1411F	FADF	FAD		0	
H1N	STICK DOWNLOCK		1411G	FADG	FAD		C	
H1N	JACKSHAFT		1411H	FADH	FAD		A	
H1N	CYCLIC DRIVE			FAE	FAB			AAAAAAAAA
H1N	CYCLIC DRIVE			FAE	FAD			FAAAAAAAAA
H1N	DRIVE LINKS	2 EA	151DH	FAEA	FAE		8	
H1N	DRIVE LINK BEARING	2 EA	151DE	FAEB	FAE		2	
H1N	TRUNNIONS	4 EA	151EH	FAEC	FAE		8	
H1N	BOOST CYLINDERS	2 EA	1421Q	FAED	FAE		7	
H1N	BOLTS		1421V	FAEE	FAE		8	
H1N	CONTROL TUBES		1421N	FAEF	FAE		8	
H1N	SUPPORTS		1421F	FAEG	FAE		1	
H1N	LEVERS		1421G	FAEH	FAE		A	
H1N	BOOT,CYLINDER		1421T	FAEJ	FAE		0	
H1N	BELLCRANKS		1421M	FAEK	FAE		8	
H1N	UNIVERSALS	2 EA	1421R	FAEL	FAE		8	
H1N	SPRING		1421S	FAEM	FAE		0	
H1N	LOWER CLEVIS	2 EA	1421U	FAEN	FAE		8	

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0C000J0001111111111122222222233333333344444444455555555566666666677777777778
12345678901234567890123456789012345678901234567890123456789012345678901234567890
HIN  MIXING LEVER                    1421P   FAFP          FAE          8
HIN  FORCE GRADIENTS      2 EA       1421J   FAED          FAE          0
HIN  MAGNETIC BRAKE       2 EA       1421K   FAER          FAE          0
HIN  FORCE TRIM SWITCH               1421L   FAES          FAF          0
HIN  FORCE TRIM SWITCH               1421L   FAES          FCC          0
HIN PILOTS CYCLIC CONTROLS                   FAF           FAE                  111111111
HIN PILOTS CYCLIC CONTROLS                   FAF           FAE          H       AAAAAAAAA
HIN  STICK                           1421A   FAFA          FAF          8
HIN  GRIP                            1421B   FAFB          FAF          0
HIN  FRICTION NUT                    1421C   FAFC          FAF          C
HIN  PILOTS LATERAL CONTROL TUB      1421N   FAFD          FAF          8
HIN  SLEEVE                          1421E   FAFE          FAF          1
HIN  BOLTS                           1421V   FAFF          FAF          8
HIN  GIMBAL                          1421D   FAFG          FAF          1
HIN  BOOT                            1421H   FAFH          FAF          0
HIN AUX LONGITUDINAL CONTROL                 FBA           F                    0C0111100
HIN ATTENUATION                              FBB           FBA                  111111111
HIN ELEVATORS POSITIONED                     FBC           FB3                  AAAAAAAAA
HIN  HORN                            11CBE   FBCA          FBC          8
HIN  HORN BEARING                    11GBF   FBCB          FBC          2
HIN  SUPPORT BEARING  92 EA<         11G3G   FBCC          FBC          1
HIN  SYNC ELEVATOR        2 EA       11G6D   FBCD          FBC          0
HIN  SKIN                 2 EA       11GBA   FBCE          FBC          0
HIN  SPAR                 2 EA       11GBB   FBCF          FBC          0
HIN  RIB                  2 EA       11GBC   FBCG          FBC          0
HIN  TRAILING EDGE PLATE  2 EA       11GBD   FBCH          FBC          C
HIN  BOLT                 E2 EA      11GBH   FBCJ          FBC          8
HIN ELEVATOR CONTROLS                        FBD           FBB                  AAAAAAAAA
HIN  CONTROL TUBES                   1431A   FBDA          FBD          8
HIN  IDLER                           1431B   FBDB          FBD          8
HIN  IDLER SUPPORT                   1431C   FBDC          FBD          1
HIN  BELLCRANKS                      1431D   FBDD          FBD          8
HIN  WALKING BEAM ASSY               1431E   FBDE          FBD          3
HIN  GUIDES                          1431F   FBDF          FBD          1
HIN ANTI TORQUE/DIRECTIONAL CON              FCA           F                    C9A111C9D
HIN ANTI TORQUE/DIRECTIONAL CON              FCA           F            B       0D0CA3D00
HIN TAIL ROTOR CONTROLLED                    FCB           FCA                  AAAAAAAAA
HIN  TAIL ROTOR                      1520D   FCBA          FCB          0
HIN  BLADE                2 EA       152AD   FCBB          FCB          8
HIN  GRIP PLATE           2 EA       152AA   FCBC          FCB          8
HIN  BUSHING              2 EA       152AB   FCBD          FCB          1
HIN  SKIN                 2 EA       152AC   FCBE          FCB          0
HIN  CURE                 2 EA       152AD   FCBF          FCB          0
HIN  HUB                             1523D   FCBH          FCB          8
HIN  TRUNNION SET                    152BA   FCBJ          FCB          8
HIN  YOKE                            152BB   FCBK          FCB          8
HIN  RETAINING NUT                   152BC   FCBL          FCB          A
HIN  BEARING, PITCH CHANGE           152BD   FCBM          FCB          2
HIN  BEARING,FLAPPING                152BE   FCBN          FCB          1
HIN TAIL ROTOR CONTROLS                      FCC           FCB                  AAAAAAAAA
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1234567890123456789012345678901234567890123456789012345678901234567890123456789
HEI  LEVER                          1442A   FCCA        FCC          8
HIN  IDLER                          1442B   FCCB        FCC          8
HIN  CONTROL TUBE                   1442C   FCCC        FCC          8
HIN  CONTROL TUBE BEARING           1442D   FCCD        FCC          2
HIN  BEARING HOUSING                1442E   FCCE        FCC          1
HIN  CROSSHEAD                      1442F   FCCF        FCC          8
HIN  CROSSHEAD BEARING              1442G   FCCG        FCC          2
HIN  PITCH LINK  32 EAC             1442H   FCCH        FCC          8
HIN  COUNTERWEIGHT BELLCRANK        1442K   FCCK        FCC          3
HIN  COUNTERWEIGHT LINK             1442L   FCCL        FCC          9
HIN  CONTROL TUBES                  1441J   FCCM        FCC          8
HIN  BELLCRANKS                     1441L   FCCN        FCC          8
HIN  BOOST CYLINDER                 1441M   FCCP        FCC          7
HIN  LINK                           1441N   FCCQ        FCC          8
HIN  MAGNETIC BRAKE                 1441H   FCCR        FCC          0
HIN  FORCE GRADIENT                 1441G   FCCS        FCC          0
HIN  LEVERS                         1441K   FCCT        FCC          8
HIN  PITCH HORN                     152AE   FCCU        FCC          8
HIN PILOTS CONTROLS                         FCD         FCC            111111111
HIN PILOTS CONTROLS                         FCD         FCC    H       AAAAAAAAA
HIN  PEDALS                         1441A   FCDA        FCD          1
HIN  PEDAL ADJUSTER LINKAGE         1441B   FCDB        FCD          5
HIN  PEDAL ADJUSTER SHAFT           1441C   FCDC        FCD          0
HIN  RIGHT ANGLE DRIVE              1441D   FCDD        FCD          0
HIN  PEDAL ADJUSTER CHAIN           1441E   FCDE        FCD          0
HIN  TUBE, PEDAL TO ADJUSTER        1441F   FCDF        FCD          8
HIN TAIL ROTOR DRIVE                        FCE         FCB            AAAAAAAAA
HIN  TAIL ROTOR DRIVE QUILL         2611B   FCEA        FCE          8
HIN  TAIL ROTOR DRIVESHAFT          2651C   FCEN        FCE          0
HIN  SHAFT SECTION   36 EAC         2651A   FCEP        FCE          8
HIN  CLAMP          MULTIC          2651B   FCEQ        FCE          1
HIN  HANGER ASSY        (4 EA)      2661C   FCER        FCE          8
HIN  HANGER             84 EAC      2661A   FCES        FCE          3
HIN  OUTER COUPLING                 2661B   FCET        FCE          8
HIN  SPHERICAL COUPLING 84 EAC      2661C   FCEU        FCE          8
HIN  SHAFT COUPLING      84 EAC     2661D   FCEV        FCE          8
HIN  SEAL                84 EAC     2661E   FCEW        FCE          1
HIN  BEARING             84 EAC     2661F   FCEX        FCE          2
HIN TAIL ROTOR CHIP DETECTION               FCF         FCB    I FCG   AAAAAAAAA
HIN T42 DEG GEARBOX CHIP DET        2631E   FCFA        FCF          A
HIN T42 DEG GEARBOX CHIP DET LI     2631F   FCFB        FCF          A
HIN T90 DEG GEARBOX CHIP DET        2641E   FCFC        FCF          A
HIN 90 DEG GEARBOX CHIP DET LT      2641F   FCFD        FCF          A
HIN  SEGMENT                        4432E   FCFE        FCF          1
HIN  LAMP                           4432F   FCFG        FCF          1
HIN TAIL ROTOR GEARBOX DRIVE                FCG         FCB            AAAAAAAAA
HIN TAIL ROTOR GEARBOX DRIVE                FCG         FCF           FAAAAAAAAA
HIN  TAIL ROTOR 42 DEG GEARBOX      26310   FCGB        FCG          8
HIN  INPUT QUILL                    2631A   FCGC        FCG          8
HIN  OUTPUT QUILL                   2631B   FCGD        FCG          8
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HLN  FILLER CAP                    2631C   FCGE      FCG          0
HLN  SIGHT GAGE                    2631D   FCGF      FCG          0
HLN  TAIL ROTOR 90 DEG GEARBOX     2641C   FCGG      FCG          8
HLN  INPUT QUILL                   2641A   FCGH      FCG          8
HLN  OUTPUT QUILL                  2641B   FCGJ      FCG          8
HLN  FILLER CAP                    2641C   FCGK      FCG          0
HLN  SIGHT GAGE                    2641D   FCGL      FCG          C
HLN  ROTOR SHAFT                   2641G   FCGM      FCG          8
HLN HYDRAULIC DISTRIBUTION         FDA     FAB                    S072222770
HLN HYDRAULIC DISTRIBUTION         FDA     FAB       B            S000090000
HLN HYDRAULIC DISTRIBUTION         FDA     FAB       H            SAAAAAAAAA
HLN HYDRAULIC DISTRIBUTION         FDA     FAC                    F999999999
HLN HYDRAULIC DISTRIBUTION         FDA     FAF                    F999999999
HLN SYSTEM NO.1 CONTROL/DIST       LFDB    FCC                    0010101000
HLN SYSTEM NO.1 CONTROL/DIST       LFDB    FDA       KRFDB        AAAAAAAAA
HLN SYSTEM NO. 2 DIST              RFDB    FDA       KLFDB        AAAAAAAAA
HLN  ELECTRICAL CONTROLS           4513C   LFDBA     LFDB         0
HLN  ELECTRICAL CONTROLS           4513C   RFDBA     RFDB         0
HLN  CKT BKR                       4513A   LFDBB     LFDB         0
HLN  CKT BKR                       4513A   RFDBB     RFDB         0
HLN  CONTROL SWITCH                4513B   LFDBC     LFDB         0
HLN  CONTROL SWITCH                4513B   RFDBC     RFDB         0
HLN  BYPASS VALVE                  4513C   LFDBD     LFDB         1
HLN  BYPASS VALVE                  4513C   RFDBD     RFDB         1
HLN  MASTER SWITCH                 4513H   LFDBE     LFDB         0
HLN  MASTER SWITCH                 4513H   RFDBE     RFDB         0
HLN  PRIORITY RELAY                4513J   LFDBF     LFDB         0
HLN  PRIORITY RELAY                4513J   RFDBF     RFDB         0
HLN  PRESSURE SWITCH               4513F   LFDBG     LFDB         5
HLN  PRESSURE SWITCH               4513F   RFDBG     RFDB         5
HLN SYSTEM PRESSURE                LFDC    LFDB                   AAAAAAAAA
HLN SYSTEM PRESSURE                LFDC    LFDD                   FAAAAAAAAA
HLN  YSTEM PRESSURE                RFDC    RFDB                   AAAAAAAAA
HLN SYSTEM PRESSURE                RFDC    RFDD                   FAAAAAAAAA
HLN  RESERVOIR                     4511C   LFDCA     LFDC         1
HLN  RESERVOIR                     4511C   RFDCA     RFDC         1
HLN  SIGHT PLUG                    4511A   LFDCB     LFDC         0
HLN  SIGHT PLUG                    4511A   RFDCB     RFDC         0
HLN  FILLER CAP                    4511B   LFDCC     LFDC         0
HLN  FILLER CAP                    4511B   RFDCC     RFDC         0
HLN  FILLER SCREEN                 4511C   LFDCD     LFDC         0
HLN  FILLER SCREEN                 4511C   RFDCD     RFDC         0
HLN  VENT SCREEN                   4511D   LFDCE     LFDC         0
HLN  VENT SCREEN                   4511D   RFDCE     RFDC         0
HLN  SCUDDER DRAIN                 4511F   LFDCF     LFDC         1
HLN  SCUDDER DRAIN                 4511E   RFDCF     RFDC         1
HLN  PUMP                          4512A   LFDCG     LFDC         A
HLN  PUMP                          4512A   RFDCG     RFDC         A
HLN  CHECK VALVE                   4512B   LFDCH     LFDC         1
HLN  CHECK VALVE                   4512B   RFDCH     RFDC         1
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12345678901234567890123456789012345678901234567890123456789012345678901234557890
H1N  RELIEF VALVE                  4512C  LFDCJ          LFDC          2
H1N  RELIEF VALVE                  4512C  RFDCJ          RFDC          2
H1N  INT. VALVE AND FILTER ASSY    4512D  LFDCK          LFDC          8
H1N  INT. VALVE AND FILTER ASSY    4512D  RFDCK          RFDC          8
H1N  PRESS OPER SHUT OFF VALVE     4512E  LFDCL          LFDC          1
H1N  PRESS OPER SHUT OFF VALVE     4512E  RFDCL          RFDC          1
H1N  GROUND TEST COUPLING          4512F  LFDCM          LFDC          0
H1N  GROUND TEST COUPLING          4512F  RFDCM          RFDC          0
H1N  DUST CAP                      4512G  LFDCN          LFDC          0
H1N  DUST CAP                      4512G  RFDCN          RFDC          0
H1N  FILTER ELEMENT %PRESS<        4512H  LFDCP          LFDC          1
H1N  FILTER ELEMENT %PRESS<        4512H  RFDCP          RFDC          1
H1N  FILTER ELEMENT %RETURN<       4512J  LFDCQ          LFDC          0
H1N  FILTER ELEMENT %RETURN<       4512J  RFDCQ          RFDC          0
H1N  ACCUMULATOR                   4512K  LFDCR          LFDC          1
H1N  ACCUMULATOR                   4512K  RFDCR          RFDC          1
H1N  IRREVERSIBLE VALVE            4512M  LFDCS          LFDC          1
H1N  IRREVERSIBLE VALVE            4512M  RFDCS          RFDC          1
H1N  HYD FILTER IND                4513K  LFDCT          LFDC          C
H1N  HYD FILTER IND                4513K  RFDCT          RFDC          0
H1N  NO 1 HYD PUMP QUILL           2611C  LFDCU          LFDC          A
H1N  NO 2 HYD PUMP QUILL           2611J  RFDCU          RFDC          A
H1N  THERMAL RELIEF VALVE          4512N  LFDCV          LFDC          1
H1N  THERMAL RELIEF VALVE          4512N  RFDCV          RFDC          1
H1N SYSTEM FAILURE WARNING                LFDD           LFDB            000000000
H1N SYSTEM FAILURE WARNING                RFDD           RFDB            000000000
H1N  PRESSURE SWITCH               4513F  LFDDA          LFDD          8
H1N  PRESSURE SWITCH               4513F  RFDDA          RFDD          3
H1N  LAMP                          4513G  LFDDB          LFDD          A
H1N  LAMP                          4513G  RFDDB          RFDD          A
H1N  SEGMENT                       4432E  LFDDD          LFDD          A
H1N  SEGMENT                       4432E  RFDDD          RFDD          A
H1N  LAMP                          4432F  LFDDE          LFDD          A
H1N  LAMP                          4432F  RFDDE          RFDD          A
H1N GROUND CONTROL                        G                              AAAAAAAAA
H1N GROUND MANEUVER                       GA             G               000000000
H1N  GROUND HANDLING WHEELS        1321D  GAA            GA            0
H1N  TOW FITTING                   1311F  GAB            GA            1
H1N  EYE BOLT                      1311K  GAC            GA            1
H1N  WHEELS                        1321A  GAD            GA            1
H1N  TIRES                         1321B  GAE            GA            1
H1N  TUBES                         1321C  GAF            GA            1
H1N  PUMP HYDRAULIC                1321D  GAG            GA            1
H1N  CRADLE                        1321E  GAH            GA            0
H1N  BELL CRANK                    1321F  GAJ            GA            0
H1N  RAMS                          1321G  GAK            GA            0
H1N  HOSE                          1321H  GAL            GA            0
H1N  PIN ATTACHMENT                1321J  GAM            GA            0
H1N  U-BOLT                        1321K  GAN            GA            0
H1N  TRUNNION                      1321L  GAP            GA            0
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00000000011111111112222222223333333334444444444555555555566666666677777777773
12345678901234567890123456789012345678901234567890123456789012345678901234567890
HIN  CLEVIS                          1321M   GAQ          GA          0
HIN MISSION SUPPORT                          M                        AAAAAAAAA
HIN OFFENSIVE ARMAMENT                       MA           M           001111100
HIN AIMING                                   MAA          MA          000000000
HIN  XM-60 SIGHT                     7525Q   MAAA         MAA         8
HIN  MOUNT                           7525A   MAAB         MAA         1
HIN  POWER CONTROL HOUSING           7525B   MAAC         MAA         1
HIN  BODY ASSY                       7525C   MAAD         MAA         8
HIN  CIRCUIT BREAKER                 7525D   MAAE         MAA         8
HIN  RETICLE LAMP                    7525E   MAAF         MAA         A
HIN  RETICLE LAMP SWITCH             7525F   MAAG         MAA         A
HIN  RHEOSTAT                        7525G   MAAH         MAA         A
HIN GUNS/GRENADE LAUNCHERS                   MAB          MA          000000000
HIN  M-93 WEAPON                     75110   MABA         MAB         0
HIN  CONTROL BOX                     7511A   MABB         MAB         8
HIN  POWER CABLE                     7511B   MABC         MAB         A
HIN  FEEDERS                         7511C   MABD         MAB         5
HIN  MOTOR                           7511D   MABE         MAB         A
HIN  CHUTE LINK                      7511E   MABF         MAB         1
HIN  RELEASE PIN                     7511F   MABG         MAB         1
HIN  YOKE AND SADDLE                 7511G   MABH         MAB         1
HIN  MOUNT PINTLE                    75111   MABJ         MAB         8
HIN  GAU-2B/A GUN                    75112   MABK         MAB         8
HIN  UPPER AMMO CAN SUPPORT          75113   MABL         MAB         1
HIN  LOWER AMMO CAN SUPPORT          75114   MABM         MAB         1
HIN  AMMO CAN COVERS                 75115   MABN         MAB         0
HIN  CHUTES AMMO                     75116   MABP         MAB         1
HIN  CHUTES AMMO SUPPORT             75117   MABQ         MAB         1
HIN  CHUTE CABLE                     75118   MABR         MAB         1
HIN  M-23 WEAPON                     75120   MABS         MAB         0
HIN  GUN                             75121   MABT         MAB         8
HIN  MOUNT                           75122   MABU         MAB         8
HIN  EJECTION BAG                    75123   MABV         MAB         0
HIN  AMMUNITION BOX                  75124   MABW         MAB         1
HIN  AMMUNITION CHUTE                75125   MABX         MAB         1
HIN  XM-129 GRENADE LAUNCHER         7536Q   MABY         MAB         0
HIN  LAUNCHER                        7536A   MABZ         MAB         8
HIN  GUN CRADLE                      7536B   MABZA        MAB         2
HIN  GUN DRIVE MOTOR                 7536C   MABZB        MAB         A
HIN  GUN DRIVE ADAPTER               7536D   MABZC        MAB         1
HIN  ADAPTER SHAFT                   7536E   MABZD        MAB         1
HIN  AMMO CHUTE                      7536F   MABZE        MAB         1
HIN  MAGAZINE                        7536G   MABZF        MAB         1
HIN  MAGAZINE DRUM MOTOR             7536H   MABZG        MAB         A
HIN  DYNAMIC BRAKE                   7536J   MABZH        MAB         1
HIN  OVERLOAD SWITCHES 2 EA          7513Q   MABZJ        MAB         5
HIN  ARMAMENT POWER RELAYS 2A        4221F   MABZK        MAB         5
HIN ROCKET LAUNCH                            MAC          MA      K BADA  111111111
HIN  EXT STORES RACK 82EA<           7547Q   MACA         MAC         0
HIN  SUPPORT ASSY 82EA<              7547A   MACB         MAC         0
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12345678901234567890123456789012345678901234567890123456789012345678901234567890
H1N  CROSS BEAM %2EA<                    7547B   MACC    MAC          0
H1N  SWAY BRACE  2EA<                    7547C   MACD    MAC          0
H1N  SUPPORT ARM %2EA<                   7547D   MACF    MAC          0
H1N  BOMB RACK >2EA<                     7547E   MACF    MAC          8
H1N  LAU-59A/B ROCKET LAUNCHER           7513D   MACG    MAC          C
H1N  YOKE                                7513A   MACH    MAC          0
H1N  RACK                                7513B   MACJ    MAC          8
H1N  LAUNCHER                            7513C   MACK    MAC          8
H1N  SAFETY PIN                          7513E   MACL    MAC          0
H1N ROCKET FIRE                                  MAD     MAC    K MAE   AAAAAAAAA
H1N  INTERVALOMETER      2 EA            7513D   MADA    MAD          8
H1N  ROTARY SWITCH       2 EA            7513F   MADB    MAD          8
H1N  POD SWITCH          2 EA            7513K   MADC    MAD          A
H1N  RESET SWITCH        2 EA            7513N   MADD    MAD          A
H1N ROCKET LAUNCHER JETTISON                     MAE     MAC     MAD  111111111
H1N SELECTIVE JETTISON                           MAF     MAE     MAG  111111111
H1N  JETTISON SWITCH %3 EA<              7513L   MAFA    MAF          1
H1N  JETTISON CKT BKR                    4221G   MAFB    MAF          8
H1N  RELAY                               7513P   MAFC    MAF          A
H1N EMERGENCY JETTISON                           MAG     MAE    K MAF   AAAAAAAAA
H1N  EMER JETT                           7514D   MAGA    MAG          0
H1N  HANDLE                              7514A   MAGB    MAG          A
H1N  CABLE                               7514B   MAGC    MAG          A
H1N  CABLE GUARD                         7514C   MAGD    MAG          0
H1N  PULLEY                              7514D   MAGE    MAG          A
H1N  BELLCRANK                           7514E   MAGF    MAG          A
H1N  SPRING                              7514F   MAGG    MAG          0
H1N ARMAMENT CONTROLS                            MAH     MAB        FAAAAAAAAA
H1N ARMAMENT CONTROLS                            MAH     MAD        AAAAAAAAA
H1N  CONTROL PANEL                       7513G   MAHA    MAH          8
H1N  MASTER SWITCH                       7513H   MAHB    MAH          A
H1N  INDICATOR LIGHT                     7513J   MAHC    MAH          0
H1N  SELECTOR SWITCH                     7513M   MAHD    MAH          8
H1N  ARM CKT BKRS 2 EA                   4221G   MAHE    MAH          5
H1N TROOP TRANSPORTATION                         MB      M          000000000
H1N  LITTER KIT                          12B00   MBA     MB           0
H1N  STANCHION                           12BAA   MBB     MB           0
H1N  BRACKET                             12BAB   MBC     MB           0
H1N  SHELF                               12BAC   MBD     MB           0
H1N  PLATE                               12BAD   MBE     MB           0
H1N  STRAP                               12BAE   MBF     MB           0
H1N  END FITTING                         12BAF   MBG     MB           0
H1N  STRAP BRACKET                       12BAG   MBH     MB           0
H1N  LITTER COT                          12BAH   MBJ     MB           0
H1N  SAFETY BELT                         12BAJ   MBK     MB           0
H1N  TROOP SEATS                         12C00   MBL     MB           0
H1N  HEADREST                            12CAA   MBM     MB           0
H1N  HEADREST COVER                      12CAB   MBN     MB           0
H1N  FITTING                             12CAC   MBP     MB           0
H1N  TOP RAIL                            12CAD   MBQ     MB           0
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0000000001111111111222222223333333344444444555555556666666677777777778
1234567890123456789012345678901234567890123456789012345678901234567890
HIN  BACK RAIL                    12CAF   MBR              MB          0
HIN  FRONT RAIL                   12CAF   MBS              MB          0
HIN  SIDE RAIL                    12CAG   MBT              MB          0
HIN  SPREADER                     12CAH   MBU              MB          0
HIN  LEG BRACE                    12CAJ   MBV              MB          0
HIN  LEG                          12CAK   MBW              MB          0
HIN  STANCHION                    12CAL   MBX              MB          0
HIN  SAFETY BELT                  12CAM   MBY              MB          0
HIN  COVER ,4 MAN                 12CAN   MBZ              MB          0
HIN  COVER ,2 MAN                 12CAP   MBZA             MB          0
HIN  COVER ,1 MAN                 12CAQ   MBZB             MB          0
HIN  STOWAGE STRAP                12CAR   MBZC             MB          0
HIN EXTERNAL CARGO SUSPENSION             MCA              M                 COAAAAAOO
HIN  HOOK                         12AAA   MCAA             MCA         0
HIN  YOKE                         12AAB   MCAB             MCA         0
HIN  BUMPER                       12AAC   MCAC             MCA         0
HIN  SHAFT                        12AAD   MCAD             MAC         0
HIN  SWIVEL HOUSING               12AAE   MCAE             MAC         0
HIN  LINK                         12AAG   MCAF             MAC         0
HIN CARGO RELEASE                         MCB              MCA     K BADA    AAAAAAAAA
HIN CARGO RELEASE                         MCB              MCBX    K EDA     AAAAAAAAA
HIN  HOOK                         12AAA   MCBA             MCB         A
HIN  LEVER                        12AAE   MCBB             MCB         A
HIN DUMMY CARD TO AVOID DUP REC           MCBX             MCA               AAAAAAAAA
HIN ELECTRICAL RELEASE                    MCC              MCB       MCD     111111111
HIN  ELECTRICAL CONTROLS          12ABO   MCCA             MCC         0
HIN  CIRCUIT BREAKER              12ABA   MCCB             MCC         8
HIN  ARMING SWITCH                12ABB   MCCC             MCC         A
HIN  RELEASE SWITCH    52 EA<     12ABC   MCCD             MCC         1
HIN  ARMED LIGHT                  12ABD   MCCE             MCC         0
HIN  LAMP                         12ABE   MCCF             MCC         0
HIN  RELEASE RELAY                12ABF   MCCG             MCC         A
HIN  BRUSH                        12ABG   MCCH             MCC         8
HIN  SLIP-RING                    12ABH   MCCJ             MCC         8
HIN MECHANICAL RELEASE                    MCD              MCB     K MCC     AAAAAAAAA
HIN  UPPER CONTROL CABLE          12AAH   MCDA             MCD         A
HIN  LOWER CONTROL CABLE          12AAJ   MCDB             MCD         A
HIN  MECHANICAL CONTROLS          12ACO   MCDC             MCD         0
HIN  PEDAL                        12ACA   MCDD             MCD         1
HIN  PEDAL STOP                   12ACB   MCDE             MCD         0
HIN  CABLE                        12ACC   MCDF             MCD         A
HIN  CABLE CONNECTOR              12ACD   MCDG             MCD         A
HIN  CABLE GUIDE                  12ACE   MCDH             MCD         1
HIN  SPRING                       12ACF   MCDJ             MCD         0
HIN  PULLEY                       12ACG   MCDK             MCD         A
HIN  PULLEY BRACKET               12ACH   MCDL             MCD         1
HIN LOUDSPEAKER SYSTEM                    MD               M                 000000000
HIN  SPEAKER AMPLIFIER            69110   MDA              MD          0
HIN  SPEAKERS    24 EA<           6911A   MDB              MD          1
HIN  REMOTE CONTROL UNIT          6911B   MDC              MD          8
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00C0000000111111111122222222223333333344444444455555555566666666677777777771
12345678901234567890123456789012345678901234567890123456789012345678901234567890
HIN  DISTRIBUTION PANEL                  6911C   MDD     MD          8
HIN  AMPLIFIERS  83 EA<                6911D   MDE     MD          3
HIN  MICROPHONE                          6912A   MDF     MD          8
HIN  SPEAKER SUPPORT                     6912B   MDG     MD          1
HIN  TAPE RECORDER                       6912C   MDH     MD          1
HIN  CABLE                               6912D   MDJ     MD          8
HIN  POWER RELAY                         6912E   MDK     MD          A
HIN  OVERLOAD CONTROL                    6912F   MDL     MD          5
HIN  CKT BKR LOUDSPEAKER                 4221G   MDM     MD          8
HIN HOIST OPERATION                              ME      M                   0000000000
HIN HOIST ACTUATION                              MEA     ME                  AAAAAAAAA
HIN  POST                                4921A   MEAA    MEA         1
HIN  BOOM                                4921B   MEAB    MEA         1
HIN  ACTUATOR                            4921C   MEAC    MEA         8
HIN  ACTUATOR LEVER                      4921D   MEAD    MEA         8
HIN  ACTUATOR PLATE                      4921E   MEAE    MEA         1
HIN  QUICK DISCONNECT ADAPTER            4921F   MEAF    MEA         1
HIN  TURNBUCKLE BRACE                    4921G   MEAG    MEA         1
HIN  BOOM COVER                          4921H   MEAH    MEA         0
HIN  CABLE GUIDE                         4921J   MEAJ    MEA         1
HIN  ROLLER                              4921K   MEAK    MEA         1
HIN  PULLEY                              4921L   MEAL    MEA         1
HIN  CABLE                               4921M   MEAM    MEA         A
HIN  WINCH                               4921N   MEAN    MEA         A
HIN  HOOK                                4921P   MEAP    MEA         5
HIN  TRIGGER                             4921Q   MEAQ    MEA         1
HIN  TRACTION SHEAVE                     4921R   MEAR    MEA         8
HIN  PRESSURE ROLLER                     4921S   MEAS    MEA         1
HIN  GUILLOTINE                          4921T   MEAT    MEA         0
HIN  HOISTING VEST                       4921U   MEAU    MEA         0
HIN  SAFETY VEST                         4921V   MEAV    MEA         0
HIN  SAFETY STRAP                        4921W   MEAW    MEA         0
HIN  GUILLOTINE CHARGE                   9711B   MEAX    MEA         0
HIN  FOREST PENETRATOR                   4936O   MEAY    MEA         1
HIN  COVER                               4931A   MEAZ    MEA         0
HIN  STRAP                               4931B   MEAZA   MEA         0
HIN  SPRING                              4931C   MEAZB   MEA         0
HIN  HORSE COLLAR                        49400   MEAZC   MEA         1
HIN  STOKES LITTER                       49500   MEAZD   MEA         1
HIN  CABLE                               4951A   MEAZE   MEA         0
HIN  CLAMP                               4951B   MEAZF   MEA         0
HIN  D-RING                              4951C   MEAZG   MEA         0
HIN  STRAP                               4951D   MEAZH   MEA         0
HIN HOIST CONTROLS                               MEB     ME                  AAAAAAAAA
HIN  ELECTRICAL CONTROLS                 4922U   MEBA    MEB         0
HIN  CIRCUIT BREAKER                     4922A   MEBB    MEB         8
HIN  PILOT CONTROL SWITCH                4922B   MEBC    MEB         1
HIN  GUILLOTINE SWITCH                   4922C   MEBD    MEB         0
HIN  POWER RELAY                         4922D   MEBE    MEB         A
HIN  OVERLOAD CONTROL SWITCH             4922E   MEBF    MEB         8
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00000000011111111112222222223333333334444444445555555556666666667777777778
12345678901234567890123456789012345678901234567890123456789012345678901234567890
HIN  RETRACT LIMIT SWITCH        4922F   MEBG        MEB          0
HIN  EXTEND LIMIT SWITCH         4922G   MEBH        MEB          8
HIN  CONTROL PENDANT             4922H   MEBJ        MEB          8
HIN  PENDANT CABLE               4922J   MEBK        MEB          8
HIN  CONTROL BOX                 4922K   MEBL        MEB          8
HIN  20 FEET WARNING LIGHT       4922L   MEBM        MEB          0
HIN  LAMP                        4922M   MEBN        MEB          0
HIN LANDING GEAR                         N                                AAAAAAAAA
HIN GEAR SUPPORT                         NA          N                    000000000
HIN  CROSS TUBE FWD              1311A   NAA         NA           1
HIN  CROSS TUBE AFT              1311B   NAB         NA           1
HIN  STRAP                       1311C   NAC         NA           1
HIN SKID GEAR                            NB          N                    000000000
HIN  SKID GEAR                   1311C   NBA         NB           0
HIN SKID TUBE                    1311D   NBB         NB           1
HIN  SKID SHOE                   1311E   NBC         NB           0
HIN  CAP                         1311G   NBD         NB           0
HIN  STEP                        1311H   NBE         NB           0
HIN  SADDLE                      1311J   NBF         NB           1
HIN26V AC BUS                            UAA         BDC                  AAAAAAAAA
HIN26V AC BUS                            UAA         BEC                  AAAAAAAAA
HIN 26V AC BUS                           UAA         BFC                  AAAAAAAAA
HIN 26V AC BUS                           UAA         BFF                  AAAAAAAAA
HIN 26VOLT AC                            UAA         CCE                  AAAAAAAAA
HIN 26VOLT AC                            UAA         CCN                  FAAAAAAAAA
HIN 26VOLT AC                            UAA         CCRB                 FAAAAAAAAA
HIN  INSTRUMENT TRANSFORMER      4231J   UAAA        UAA          A
HIN  XFMR CKT BKR                4241C   UAAB        UAA          1
HIN ESS AC BUS                           UAB         BBJ                  AAAAAAAAA
HIN ESS AC BUS                           UAB         BFM                  AAAAAAAAA
HIN ESS AC BUS                           UAB         BFP                  FAAAAAAAAA
HIN ESSENTIAL AC                         UAB         CCN                  AAAAAAAAA
HIN ESSENTIAL AC                         UAB         CCPB                 AAAAAAAAA
HIN ESSENTIAL AC BUS                     UAB         DBCA                 AAAAAAAAA
HIN ESSENTIAL AC BUS                     UAB         DBEC                 AAAAAAAAA
HIN ESSENTIAL AC BUS                     UAB         EAT                  AAAAAAAAA
HIN ESSENTIAL AC BUS                     UAB         UAA                  AAAAAAAAA
HIN ESSENTIAL AC BUS                     UAB         UAF                  FAAAAAAAAA
HIN  ESSENTIAL BUS               4241A   UABA        UAB          1
HIN  AC POWER RELAY              4231H   UABB        UAB          1
HIN NON ESSENTIAL AC                     UAC         CCRB                 AAAAAAAAA
HIN NON ESS AC BUS                       UAC         DBEC                 AAAAAAAAA
HIN  NON ESSENTIAL BUS           4241B   UACA        UAC          1
HIN  AC POWER RELAY              4231H   UACB        UAC          A
HIN MAIN AC SOURCE                       UAD         UAB      UAG     111111111
HIN  AC POWER SUPPLY             4231D   UADA        UAD          0
HIN  MAIN INVERTER               4231A   UADB        UAD          A
HIN  MAIN INVERTER OVERLOAD CON  4231B   UADC        UAD          5
HIN  MAIN INVERTER POWER RELAY   4231C   UADD        UAD          A
HIN  INVERTER CONTROL SWITCH     4231G   UADE        UAD          5
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0000000001111111111222222222233333333334444444444555555555566666666677777777778
1234567890123456789012345678901234567890123456789012345678901234567890123456789
HIN  MAIN INV CKT CHKR          4221G   UADF            UAD          1
HIN STANDBY AC SOURCE                   UAE             UAC            AAAAAAAAA
HIN STANDBY AC SOURCE                   UAF             UAG            AAAAAAAAA
HIN  STANDBY INVERTER           4231D   UAEA            UAE          A
HIN  STBY INV OVERLOAD CONTROL  4231E   UAEB            UAE          5
HIN  STBY INV POWER RELAY       4231F   UAEC            UAE          A
HIN  STBY INV CKT BKR           4221G   UAED            UAE          1
HIN  INVERTER CONTROL SWITCH    4231G   UAEE            UAE          5
HIN AC POWER STATUS                     UAF             UAG            111111111
HIN  VOLTMETER                  4251A   UAFA            UAF          1
HIN  AC FAILURE RELAY           4251E   UAFB            UAF          1
HIN  SEGMENT                    4432E   UAFH            UAF          1
HIN  LAMP                       4432F   UAFJ            UAF          1
HIN STANDBY AC POWER                    UAG             UAB    K UAD   AAAAAAAAA
HIN ESS DC BUS                          UDA             BABG           AAAAAAAAA
HIN ESS DC BUS                          UDA             BAPE           AAAAAAAAA
HIN ESS DC BUS                          UDA             BAQC           AAAAAAAAA
HIN ESS DC BUS                          UDA             BBD            AAAAAAAAA
HIN ESS DC BUS                          UDA             BBG           FAAAAAAAAA
HIN ESS DC BUS                          UDA             BBK            AAAAAAAAA
HIN ESS DC BUS                          UDA             BCE            AAAAAAAAA
HIN ESS DC BUS                          UDA             BDD            AAAAAAAAA
HIN ESS DC BUS                          UDA             BDE           SAAAAAAAAA
HIN ESS DC BUS                          UDA             BDF           FAAAAAAAAA
HIN ESS DC BUS                          UDA             BDG           FAAAAAAAAA
HIN ESS DC BUS                          UDA             BDH            AAAAAAAAA
HIN ESS DC BUS                          UDA             BED            AAAAAAAAA
HIN ESS DC BUS                          UDA             BEE            AAAAAAAAA
HIN ESS DC BUS                          UDA             BEG            AAAAAAAAA
HIN ESS DC BUS                          UDA             BFD            AAAAAAAAA
HIN ESS DC BUS                          UDA             BFE            AAAAAAAAA
HIN ESS DC BUS                          UDA             BFR            AAAAAAAAA
HIN ESSENTIAL DC                        UDA             CAA            AAAAAAAAA
HIN ESSENTIAL DC                        UDA             CB             AAAAAAAAA
HIN ESSENTIAL DC BUS                    UDA             CCL           S889888888
HIN ESSENTIAL DC                        UDA             CCM           FAAAAAAAAA
HIN ESSENTIAL DC                        UDA             CCPA          FAAAAAAAAA
HIN ESSENTIAL DC BUS                    UDA             CCPB          FAAAAAAAAA
HIN ESSENTIAL DC                        UDA             CCR           FAAAAAAAAA
HIN ESSENTIAL DC BUS                    UDA             DAB            AAAAAAAAA
HIN ESSENTIAL DC BUS                    UDA             DAC           FAAAAAAAAA
HIN ESSENTIAL DC BUS                    UDA             DAD            AAAAAAAAA
HIN ESSENTIAL DC BUS                    UDA             EAA            AAAAAAAAA
HIN ESSENTIAL DC BUS                    UDA             EAR           FAAAAAAAAA
HIN ESSENTIAL DC BUS                    UDA             EAS           FAAAAAAAAA
HIN ESSENTIAL DC BUS                    UDA             EAU            AAAAAAAAA
HIN ESSENTIAL DC BUS                    UDA             EBC            AAAAAAAAA
HIN ESSENTIAL DC BUS                    UDA             EBG            AAAAAAAAA
HIN ESSENTIAL DC BUS                    UDA             ECB            AAAAAAAAA
HIN ESSENTIAL DC BUS                    UDA             FCF            AAAAAAAAA
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000C000001111111111222222222233333333334444444444555555555566666666677777777773
123456789012345678901234567890123456789012345678901234567890123456789012345678900
MIN ESSENTIAL DC BUS                          UDA          LFDD          FAAAAAAAAA
MIN ESSENTIAL DC BUS                          UDA          KFDD          FAAAAAAAAA
MIN ESSENTIAL DCBUS                           UDA           MAA          FAAAAAAAAA
MIN ESSENTIAL DCBUS                           UDA           MAF          FAAAAAAAAA
MIN ESSENTIAL DCBUS                           UDA           MAH           AAAAAAAAA
MIN ESSENTIAL DC BUS                          UDA           MCC           AAAAAAAAA
MIN ESSENTIAL DC BUS                          UDA           UAD           AAAAAAAAA
MIN  ESSENTIAL BUS                  4221A     UDAA          UDA          1
MIN NON ESS DC                                UDB           BBC           AAAAAAAAA
MIN NON ESSENTIAL DC BUS                      UDB           EAV           AAAAAAAAA
MIN NONESSENTIAL DC BUS                       UDB           MD            AAAAAAAAA
MIN  NONESSENTIAL DC BUS                      UDB           MEB           AAAAAAAAA
MIN NON ESSENTIAL DC BUS                      UDB           UAE           AAAAAAAAA
MIN  NON ESSENTIAL BUS              42218     UDBA          UDB          1
MIN  NON ESSENTIAL BUS RELAY        4221D     UDBB          UDB          A
MIN  NON ESSENTIAL BUS SWITCH       4221F     UDBC          UDB          A
MIN MAIN DC BUS                               UDC           BABG          SAAAAAAAAA
MIN MAIN DC BUS                               UDC           BAPE          SAAAAAAAAA
MIN MAIN DC BUS                               UDC           BAQC          SAAAAAAAAA
MIN MAIN DC BUS                               UDC           BBC           SAAAAAAAAA
MIN MAIN DC BUS                               UDC           BBD           SAAAAAAAAA
MIN MAIN DC BUS                               UDC           BBH           SAAAAAAAAA
MIN MAIN DC BUS                               UDC           BCE           SAAAAAAAAA
MIN MAIN DC BUS                               UDC           BDB           SAAAAAAAAA
MIN MAIN DC BUS                               UDC           BDE           SAAAAAAAAA
MIN MAIN DC BUS                               UDC           BDH           SAAAAAAAAA
MIN MAIN DC BUS                               UDC           BEB           SAAAAAAAAA
MIN MAIN DC BUS                               UDC           BEE           SAAAAAAAAA
MIN MAIN DC BUS                               UDC           BEG           SAAAAAAAAA
MIN MAIN DC BUS                               UDC           BFB           SAAAAAAAAA
MIN MAIN DC BUS                               UDC           BFE           SAAAAAAAAA
MIN MAIN DC BUS                               UDC           BFF           SAAAAAAAAA
MIN MAIN DC BUS                               UDC           BFM           SAAAAAAAAA
MIN MAIN DC BUS                               UDC           BFR           SAAAAAAAAA
MIN MAIN DC BUS                               UDC           CAA           SAAAAAAAAA
MIN MAIN DC BUS                               UDC           CB            SAAAAAAAAA
MIN MAIN DC BUS                               UDC           CCD           SAAAAAAAAA
MIN MAIN DC BUS                               UDC           DAB           SAAAAAAAA1
MIN MAIN DC BUS                               UDC           DAD           SAAAAAAAAA
MIN MAIN DC BUS                               UDC           DBCA          SAAAAAAAAA
MIN MAIN DC BUS                               UDC           DBEC          SAAAAAAAAA
MIN MAIN DC BUS                               UDC           EAA           SAAAAAAAAA
MIN MAIN DC BUS                               UDC           EAQ           SOOOOOOAOO
MIN MAIN DC BUS                               UDC           EBC           SAAAAAAAAA
MIN MAIN DC BUS                               UDC           EBG           SAAAAAAAAA
MIN MAIN DC BUS                               UDC           ECB           SAAAAAAAAA
MIN MAIN DC BUS                               UDC           FCF           SAAAAAAAAA
MIN MAIN DC BUS                               UDC           MAB           FAAAAAAAAA
MIN MAIN DC BUS                               UDC           MAH           SAAAAAAAAA
MIN MAIN DC BUS                               UDC           MCC           SAAAAAAAAA
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0000000000111111111122222222223333333333444444444455555555556666666667777777778
1234567890123456789012345678901234567890123456789012345678901234567890123456789
HIN MAIN DC BUS                          UDC          MD              SAAAAAAAAA
HIN  MAIN DC BUS                         UDC          MEB             SAAAAAAAAA
HIN MAIN DC BUS                          UDC          UDA             FAAAAAAAAA
HIN MAIN DC BUS                          UDC          UDB             FAAAAAAAAA
HIN  DC POWER SUPPLY          42110      UDCA         UDC           0
HIN  DC POWER DISTRIBUTION    4221G      UDCB         UDC           0
HIN NORMAL DC SOURCE                     UDD          UDC     UDE     333333333
HIN EMERGENCY SOURCE                     UDE          BAN             AAAAAAAAA
HIN EMERGENCY SOURCE                     UDE          UDC   K UDD     AAAAAAAAA
HIN  BATTERY                  4211A      UDEA         UDE           8
HIN  BATTERY RELAY            4211D      UDEB         UDE           A
HIN  BATTERY SWITCH           4211E      UDEC         UDE           A
HIN  BATTERY DISCONNECT       4211B      UDED         UDE           5
HIN  BATTERY VENT HOSES       4211C      UDEE         UDE           1
HIN  BATTERY CONTAINER        4211F      UDEF         UDE           0
HIN GROUND POWER                         UDF          BAN             000000000
HIN GROUND POWER                         UDF          UDC             000000000
HIN  EXT PWR RECEPTACLE       4211G      UDFA         UDF           1
HIN  EXT PWR RELAY            4211H      UDFB         UDF           A
HIN  EXT PWR DIODE            4211J      UDFC         UDF           1
HIN  EXT PWR DOOR LIMIT SWITCH 4251D     UDFD         UDF           0
HIN ONE GENERATOR POWER                  UDG          UDD   K UDH     AAAAAAAAA
HIN ONE GENERATOR POWER                  UDG          UDH             SAAAAAAAAA
HIN  STARTER GENERATOR        4211K      UDGA         UDG           A
HIN  COOLING AIR DUCT         4211L      UDGB         UDG           0
HIN  GENERATOR SWITCH         4211M      UDGC         UDG           A
HIN  GEN FIELD CONTROL RELAY  4211N      UDGD         UDG           A
HIN  VOLTAGE REGULATOR        4211P      UDGE         UDG           8
HIN  VOLTAGE RHEOSTAT         4211Q      UDGF         UDG           8
HIN  OVERVOLTAGE RELAY        4211R      UDGG         UDG           5
HIN  REVERSE CURRENT RELAY    4211S      UDGH         UDG           5
HIN  STARTER GENERATOR CONTROL 4211T     UDGJ         UDG           1
HIN  SHUNT CONTROL RELAY      4211U      UDGK         UDG           1
HIN  BUS CONTROL RELAY        4221C      UDGL         UDG           A
HIN  GEN CKT BKRS #2 BAC      4221G      UDGM         UDG           1
HIN  STARTER GEARSHAFT        22ALG      UDGN         UDG           A
HIN ONE GENERATOR FAILED                 UDH          UDH             FAAAAAAAAA
HIN DC POWER STATUS                      UDJ          UDC             000000000
HIN  DUAL VOLTMETER           4251A      UDJA         UDJ           1
HIN  VOLTMETER SELECT SWITCH  4251B      UDJB         UDJ           1
HIN  DUAL AMMETER             4251C      UDJC         UDJ           1
HIN  SEGMENT                  4432E      UDJF         UDJ           1
HIN  LAMP                     4432F      UDJG         UDJ           1

CARD COUNT IS 00001692. CARDS WITH ERRORS 00000000
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